AVIATION WEEK

OCT. 9, 1950

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Marquette Announces New Electric Aircraft Windshield Wiper with . . .

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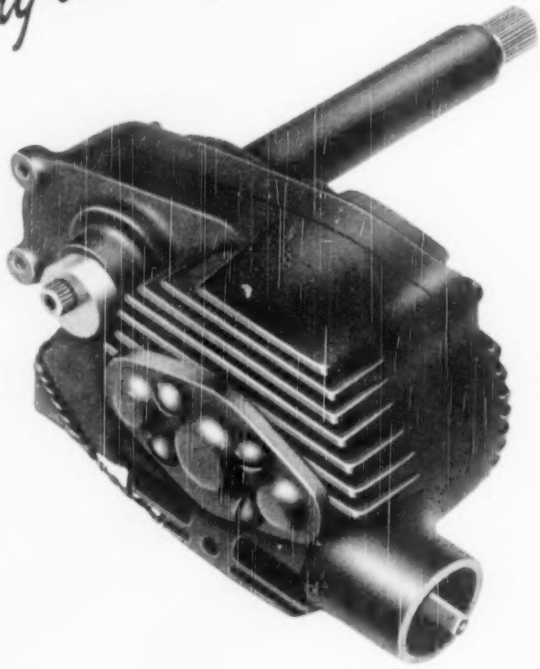

The new Model V22E is the first electric aircraft windshield wiper to automatically park the blade out of the line of vision and lock it in that position.

Pilots are quick to appreciate the *safety* and *convenience* of this important feature.

This newest model (illustrated at right) is the only modern electric wiper to successfully pass the rigid test requirements of our Armed Services. It has been approved for installation on all types of aircraft having glass windshields, including our modern jet fighters.

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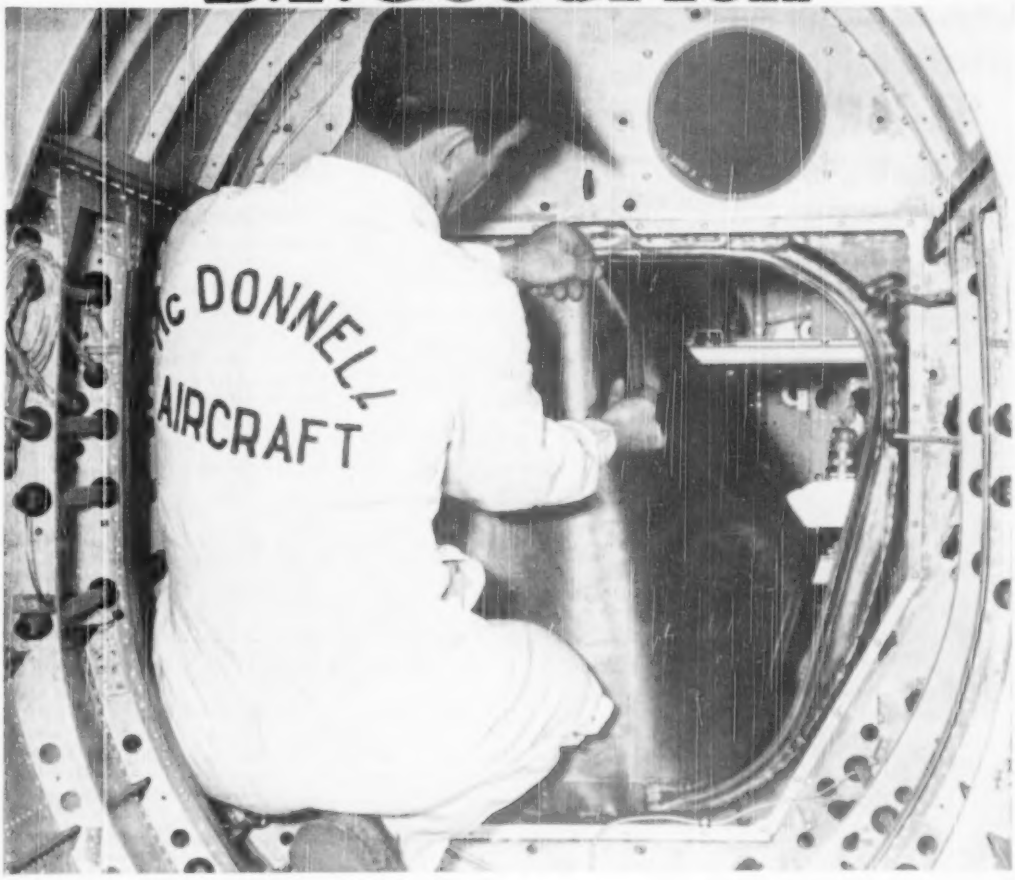

It lets men in – keeps fumes out

FUMES from a jet engine make a pilot pretty groggy if they get into the cockpit.

One way to keep them out is to put a partition between the cockpit and the rest of the fuselage. But that poses a problem. With a standard metal partition, mechanics have to fiddle with a lot of bolts or screws every time they want to get into the fuselage for maintenance work. That eats up man-hours.

Engineers at McDonnell Aircraft wanted a partition for the Banshee that would stop the fuming and the fussing too. They turned to B. F. Goodrich.

BFG engineers figured one of their developments – a Pressure Sealing Zipper – might be the answer. They applied the zipper to a sheet of rubberized nylon, came up with a Fume Curtain that turned the trick.

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B. F. Goodrich Pressure Sealing Zippers are extremely flexible. They fit snugly around any shape—such as squares, kidneys and the like where clamps won't seal. They are adaptable to any kind of covering and to light or heavy requirements. They *remove* right onto rubber fabric or metal. They save space and weight. They resist damage. Typical applications besides fume curtains are airplane doors, air ducts, interior covers, control surface seals.

If you have a problem that B. F. Goodrich research and engineering might solve, write *The B. F. Goodrich Co., Aircraft Division, Akron, Ohio.*

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Aviation Week

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Aviation Week — Volume 53, Number 15 — [illegible]

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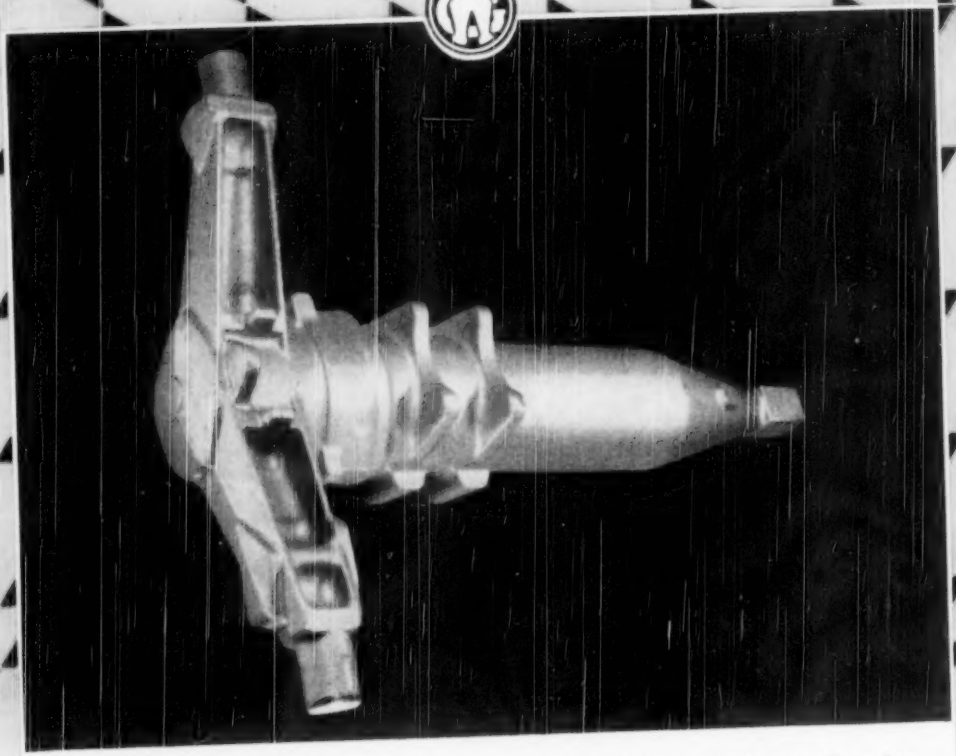
AMERICAN AIRLINES

20 YEARS

FAFNIR

American Airlines—the air transportation system that helps make a neighborhood out of a nation carries more passengers than any other airline in the world — $3\frac{1}{4}$ million people, 1.6 billion passenger miles in '49. For two decades, every American Flagship has been equipped with Fafnir Ball Bearings either as original equipment or replacement. Behind this uninterrupted partnership is something more than just good bearings. It's a Fafnir attitude and aptitude — a way of looking at ball bearings from the user's side, an aptitude gained from more than twenty years' specialization in aircraft ball bearings. The Fafnir Bearing Company, New Britain, Connecticut

Fafnir Ball Bearing Rod Ends, one of the Fafnir Ball Bearing units regularly specified by American Airlines. Light, compact design — inner race ground directly on shank member. Special heat treatment, an exclusive Fafnir feature, insures shank toughness—eliminates brittleness and cracking. Inner race extension beyond face obviates need of spacers.



Forgings for the aircraft industry today demand the utmost in engineering and production techniques and in scientific laboratory control. This massive complicated landing gear component, weighing over 400 pounds, is typical of Wyman-Gordon's forging contribution to the ever-growing progress in aircraft design.

In crankshafts for the automotive industry and in all types of aircraft forgings, steel and light alloy, Wyman-Gordon has pioneered in the development of forging "know-how"—there is no substitute for Wyman-Gordon experience.

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NEWS DIGEST

DOMESTIC

Backlogs of aircraft, engine and propeller companies as of June 30 came to $2988 million, $85 million more than the backlog for this year's first quarter. First-half unfilled orders were complete planes and parts, 64 percent; engines and parts, 26 percent; props and spares, 3 percent. The remainder covered other products and services. Net new orders for the second-quarter of '50 were $531 million.

Last of twelve Martin 2-0-2As for Trans World Airlines has been delivered by Glenn L. Martin Co. All of the planes were delivered on or before scheduled dates.

Aviation industry representatives are being invited by the staff of the Senate House Joint Committee on Taxation to background conference for preparation of one of a series of industry reports on proposed excess profits tax legislation.

Stratos Corp. has begun deliveries to Pan American Airways of the Stratos Model S60-5 superchargers with which PAA will equip its entire fleet of Lockheed Model 049 Constellations (AVIATION WEEK Dec. 19, 1949). First Model 049 with the new installation now is flying.

CAB has asked comments before Oct. 30 on proposed changes in Parts 1, 2, 3, 4b, 6 and 15 of the Civil Air Regulations. All deal with airworthiness requirements. Probably most sweeping changes are in Part 3, pertaining to personal aircraft. These would: Eliminate service test requirements for planes of 6000-lb. or less gross weight; modify takeoff, climb, landing and trim requirements; and require stall indicators.

Ft. Worth procurement field office of the Air Materiel Command is preparing to move from its location in the Ft. Worth Convair plant to downtown Ft. Worth offices in the Ledger Bldg. Col. Beverly Warren, chief of the office, is in charge of administering Air Force contracts with manufacturers and suppliers in the 11-state South and Southwest area centering at Ft. Worth.

Aircraft industry standardization on engineering requirements for integrally stiffened aluminum sheet is expected to result from an AIA technical committee project in which Lockheed is taking leadership. Requirements including sheet thickness, rib height and rib spacing will be studied in an effort to select a minimum number of configurations for standardization. The project indicates growing industry attention to the new semi-finished material for aircraft wings and fuselages first demonstrated as practical by Reynolds Metals Co. at Phoenix, Ariz., last spring (AVIATION WEEK Apr. 24).

Personal aircraft shipments by ten companies in August totaled 338 planes valued at $2,017,000, according to the Aircraft Industries Assn. Four-place and larger planes numbered 221. In July, shipments of nine companies were 302 planes valued at $1,673,000. It was inadvertently reported in this space last week that shipments were 25 planes, valued at $168,649. Those figures were for exports of personal planes in August.

Pacific Airlift contractors will get a second 10 percent cut this week. The original 66 planes leased from airlines has been reduced to 62, and now will be pared to 58 on Oct. 12 and 56 on Oct. 15. The lift has been operating 252,000 plane miles per day. In three months, MATS and its contractors have hauled nearly 8000 tons, including almost 34,000 passengers, to the fighting theater. Another 34,000 passengers, including 4400 patients, have been returned to the U. S.

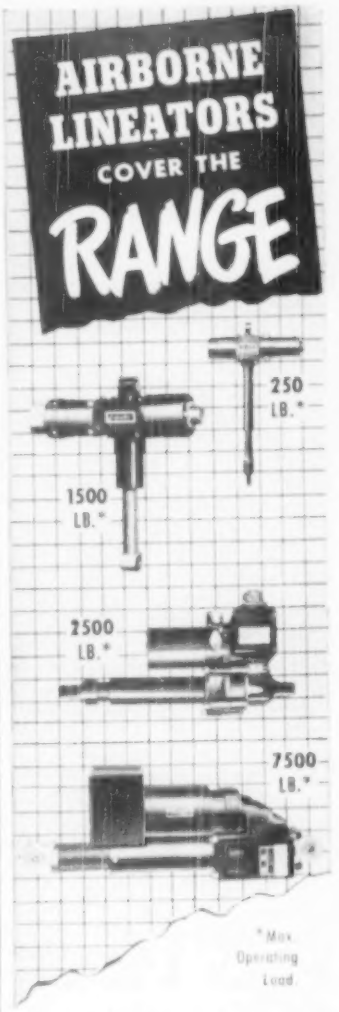
FINANCIAL

All American Airways in August turned in its first operating profit since it started moving passengers over feeder routes in March 1949. President Bob Love declares the August profit of $10,547 shows that AAA can develop enough non-mail revenue to achieve self-sufficiency eventually. Present effective mail rate is just over 40 cents a plane mile. The company carried a record 19,596 passengers, 2,753,682 passenger revenue miles.

Continental Motors and subsidiaries report net earnings of $1,139,716 for the quarter ended July 31, compared with $381,591 in the like period last year. Sales in the July quarter this year were $27,449,455, compared with $15,643,359 in the same period in 1949. Consolidated net earnings for the nine months ending July 31 were $2,515,667.

INTERNATIONAL

Avro Canada is seeking around 5000 skilled aircraft workers at its Malton, Ontario, plant, and is hiring at a rate of 100 a week following RCAF's new order for additional CF-100 Canuck twin-jet night fighters, which presumably included additional orders for Avro Orenda jet engines to power them.



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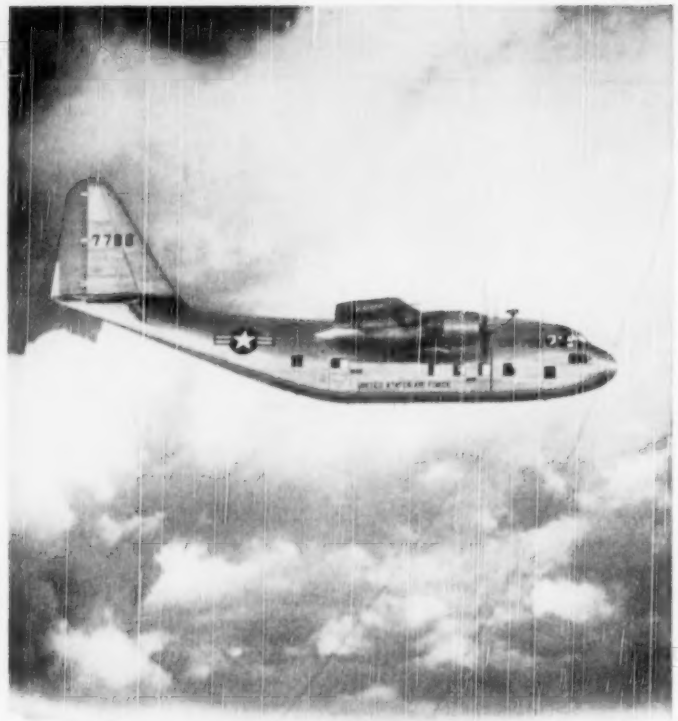

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AVIATION CALENDAR

Oct. 9-12—Autumn meeting of National Academy of Sciences, General Electric Co. research laboratory, Schenectady.

Oct. 9-12—Fifth annual industrial packaging and materials handling exposition, Convention Hall, Philadelphia.

Oct. 10—Meeting of the Joint Machine Tool Industry Mobilization Reserve Group, Royal York Hotel, Toronto, Canada.

Oct. 12-13—1950 conference on airport management and operations, Max Westheimer Field, North Campus, University of Oklahoma, Norman, Okla.

Oct. 16-20—1950 annual general meeting of the International Air Transport Assn., Fairmont Hotel, San Francisco.

Oct. 16-20—Fourth meeting of CAA Airport Advisory Committee, Ft. Worth.

Oct. 17—ICAO Middle East regional air navigation meeting, second session, Istanbul, Turkey.

Oct. 17-18—Third annual airport management conference, sponsored by N. Y. State Commerce Dept., Hotel Onondaga, Syracuse, N. Y.

Oct. 18-20—Annual national conference of the Society of the Plastics Industry, Inc., in cooperation with Harvard Business School, Swampscott, Mass.

Oct. 22—Second annual aircraft efficiency rare, sponsored by the aviation committee of the Colorado Springs Junior Chamber of Commerce, Colo. (Alternate rain date, Oct. 29.)

Oct. 22-28—31st annual meeting, American Welding Society, Hotel Sherman, Chicago, Ill.

Oct. 24-25—Third biennial Materials Handling Conference, sponsored by Westinghouse Electric Corp. Hotel Statler, Buffalo, N. Y.

Oct. 24-26—Annual meeting of Society for Non-Destructive Testing, in conjunction with National Metals Congress, Morrison Hotel, Chicago.

Oct. 26-27—Fifth annual Arizona aviation conference, sponsored by the aviation committee of the Tucson Chamber of Commerce, Tucson, Ariz.

Oct. 30-31, Nov. 1—Flight Safety Foundation annual Safety Seminar, Denver, Colo.

Nov. 14—ICAO rules of the air and air traffic control meeting, fourth session, Montreal, Canada.

Nov. 29-Dec. 1—Eighth annual meeting of Aviation Distributors and Manufacturers Assn., Ambassador Hotel, Los Angeles.

Nov. 30—Airport fire safety clinic, sponsored by Committee on Aviation and Airport Fire Protection of the National Fire Protection Assn., Baker Hotel, Dallas.

Dec. 16—14th Wright Brothers Lecture, Institute of Aeronautical Sciences, U. S. Chamber of Commerce Auditorium, Washington, D. C.

Jan. 15-18, 1951—Plant maintenance show and concurrent conference on plant maintenance techniques, Cleveland, Ohio.

Jan. 29-Feb. 1—19th annual meeting of the Institute of Aeronautical Sciences, Hotel Astor, N. Y.

PICTURE CREDITS

8—(top) Keystone, (center) Lock, (bottom left) Lacy-Shaw, 12—(top) Zborsky, 14—Convair, 15—Northrop, 16—Boeing, 17—Convair, 24, 31 David A. Anderton, 34—DOD Dept. of Defense, 38—Flight.

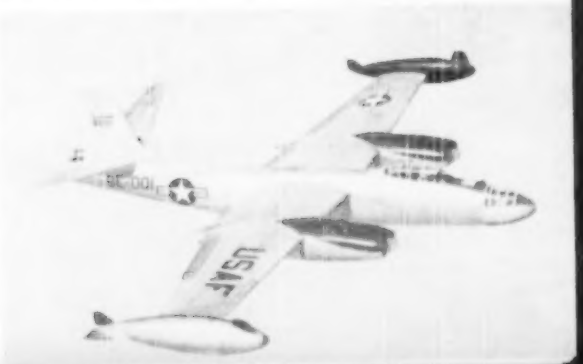
TRYING ALL THE ANGLES—Delta-wing Avro 707B, the only one of its configuration flying in Britain (see p. 20), is undergoing intensive test flying for research. Split intake for the single Rolls-Royce Derwent is located at the base of the fin.

New Planes In the News

SABRE DONS THE MAPLE LEAF—First North American F-86E built by Canadair displays its RCAF markings. Initial order of 100 will be powered by GE J47 turbojets. Later planes will get the Canadair-designed Avro Orenda of about 7200 lb. static thrust.

XC-120 UNPACKED—Minus its 2700 cu. ft. capacity cargo pack, the new Fairchild Packplane (below) shows its unusual shape.

THE TANKED TORNADO—NAA's B-45C four-jet bomber stretches its "over 800 mi. radius" by use of finned wing tanks.



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WHO'S WHERE

In the Front Office

Noel B. McLean is new president of Fairchild Corp., succeeding the retiring president and founder, **Earl D. Osborn**. Osborn has been elected to the newly created position of chairman of the board. Fairchild's new president, who joined the company in 1946, was with Bendix Aviation Corp. for 17 years as general manager of the Philadelphia division and of the Marine division.

Felix von Ballusek has been named executive vice president of KLM Royal Dutch Airlines. He joined KLM in 1934 as head of the economic bureau. He is a member of IATA's traffic committee.

Talmadge L. "Tommy" Boyd, American Airlines' regional director for the eastern region, has stepped up to general director-operations for AA's entire system during the absence of **Lawrence G. Fritz**, vice president-operations. Fritz is leaving AA for three months to undergo medical treatment of a World War II-contracted ailment.

Otis E. Kline has been named executive vice president and a director of United Air Lines. Kline has been in aviation for 22 years and has served as executive assistant to UAL's president since 1940.

Changes

▶ **Among the Manufacturers**—**Charles P. Haskell** has been named Taylorcraft, Inc.'s resident representative at Wright Field. . . . **Richard B. Clevering**, Allison's Dayton zone manager, has been transferred to the Washington, D. C. office in the same capacity. **James E. Knott**, the company's sales engineering manager, will take over at Dayton.

E. M. Eickman has been named to the new post of assistant manager of Goodyear's Aviation Products division. . . . **Claude Witze** has resigned as aviation editor of the Providence (R. I.) Journal to become director of industrial and public relations for Synthron, Inc., manufacturing chemists.

Hudson Phillips has been made Convair's director of public relations. . . . New works manager at Curtiss-Wright's Propeller division is **Charles W. Frick**. **George E. Sevaris** was promoted to superintendent of steel blade manufacturing, **Warren P. Cross** was elevated to superintendent of machine shops, and **Harold B. Snyder** was appointed superintendent, production machine shops.

Walter Tydon is Fairchild Aircraft division's new chief of design engineering. His prior connection was as chief design engineer at Curtiss-Wright's Buffalo Caloric plant, where he worked on the XF-87 Blackhawk all-weather jet fighter. He was also chief engineer at C-W's Buffalo plant during World War II, in charge of the P-40 and C-46 projects.

Edward J. Creswell has been appointed labor relations director at the Glenn L. Martin Co. . . . **E. J. Foley** has been named eastern representative of Gordon D. Brown & Associates, aircraft equipment makers. He will work out of a Washington office.

INDUSTRY OBSERVER

▶ Paradoxical procurement situation in 1951 plane schedules has the Air Force buying more seaplanes than the Navy. The Air Force order for between 60 and 80 amphibians goes to Grumman for SA-16 rescue planes while the Navy order is for less than 10 new Convair turboprop long-range flying boats. Originally scheduled as patrol bombers, these craft have been transformed into cargo planes, and designated R3Y-1s.

▶ Speed of the big Convair flying boat is said to approach the 400-mph. mark. This is well beyond that of earlier seaplanes. But still further flying boat hull refinements are under development pointing toward blended hull-wing configurations which promise to reach transonic speeds within less than two years.

▶ **Demonstrations in a Piper Cub equipped with stall warning indicators are showing flight examiners, instructors and pilots new CAA technique for stall recovery. Basic requirement of the new technique is not to dive a plane to recover from a stall but merely to "hold the nose" of the plane on the horizon line. Resultant loss of altitude is two-thirds less than by the old diving method, although recovery is slower.**

▶ Lockheed Aircraft Service, at Burbank, has started overhaul and modernization of some of USAF's older F-80 jet fighters, returned from bases in the U. S. Europe and the Far East. Some have been in service as long as three years.

▶ **Piper Aircraft Corp., unlike most of its competitors who are turning to military production, is still beating the bushes at home and overseas for personal plane sales. A total of 108 Super Cubs and four-place Pacers were sold in a recent four-weeks sales tour by Frank Sheridan Jonas, export representative in South and Central America. Most of the South American planes are being ferried down, rather than shipped. Two Chilean pilots recently flew two new Pacers from Lock Haven to Santiago, Chile, 8000 miles, in 10 days.**

▶ Navy concentration of helicopter orders on the Piasecki HUP shipboard helicopter, both for utility search and rescue and for anti-submarine patrol work has boosted total 1951 Navy orders for that type well over 100. Existing Piasecki production facilities have been so taxed that the company is subcontracting fuselage fabrication to Goodyear Aircraft at Akron and to Twin Coach at Buffalo. The combined HUP Navy orders are the largest which one service has placed for any one type of rotary-wing craft.

▶ **First production order for blimps since World War II, scheduled by Navy in its 1951 program, calls for several more of the big N-type airships to follow the prototype now nearing completion in Goodyear's Akron balloon dock.** (See page 34.)

▶ A composite design for a jet transport of five years hence, as described by Boeing Vice President Edward C. Wells, calls for a cruising speed of at least 500 mph., and operation at 35,000 to 40,000 ft. altitude over a 1500-mi. range with a payload of 50 or more passengers.

▶ **Replacement of York transports with Lockheed Constellations on BOAC's London to Santiago, Chile, route, scheduled last week, was to mark the end of converted Lancaster bomber-transports on BOAC routes. It would mean also a 7-hr. reduction in flying time to Santiago. Previously the Yorks had operated between Nassau and Santiago, with Constellations on the London-Nassau leg of the route.**

▶ Higher valuations now quoted on relatively young DC-3 and C-47 transports, are making some of the airlines who disposed of their planes for a figurative song, sadly throw them again to sell at these newer and higher prices.

AVIATION WEEK

VOL. 53, NO. 15

OCTOBER 9, 1950

Helicopter Industry Gets First Big Orders

Fiscal 1951 contracts total more than 500; worth $75 million.

By Alexander McSurely

The biggest military orders ever placed for rotary-wing craft are putting the 10-year-old U.S. helicopter industry on the soliest financial foundation it has known.

Scheduled for fiscal 1951 procurement, these quantity orders from Navy, Army and Air Force add up to about 500 helicopters, with a total dollar value of about $75 million.

▶ **Helicopter Parade**—No. 1 helicopter on the lot from the standpoint of orders is the Sikorsky 8-10 place machine designated H-19 by the Air Force and HO4S by the Navy. Combined orders totaling approximately 200 have been placed for this machine, divided almost equally between Navy, Army and Air Force.

Piasecki's smaller tandem rotor HUP helicopter ranks No. 2 with well over 100 orders, all Navy.

Third on basis of quantity is the two-place Bell H-13, with combined Army and Navy orders for over 100.

Over 25 orders have been placed by the Navy for Sikorsky's smaller HO5S machine.

The remainder of the orders are for the new Piasecki H-21 Air Force rescue helicopter, the Hiller HTE and the Kaman HOK, both small trainer/liaison type helicopters.

Not appearing in the 1951 orders reported above are the Navy orders previously placed for three large experimental Bell helicopters for anti-submarine warfare, and 1950 orders still being filled for Piasecki HUP's and HRP-2s, for the first five Sikorsky H-19s, and for Bell H-13s.

▶ **World War II Types**—The 1951 orders are well above the total helicopter orders placed for World War II. Only three helicopter types, all Sikorsky designs, were ordered in quantity during the war.

World War II orders amounted to about 130 R-4s (the first production machines, about 65 R-5s (which eventually developed into the postwar H-5) and over 200 R-6s (designed by Sikorsky but produced by Nash-Kelvinator Corp.). None of these machines were outstanding in performance by the

BEST SELLER among military copters is Sikorsky HO4S (H-19); about 200 are on order.

HILLER'S YH-23, military version of the Model 360, is also the Navy's HTE.

larger helicopters which constitute the bulk of the 1951 orders.

Size of the helicopter procurement program indicates a new importance which rotary-wing aircraft is now assuming in various tactical uses.

• **Assault.** Catered in actual combat is the use of many large helicopters as assault transports, bringing in packages of ground troops and combat equipment for spot landings to capture key points. Marine demonstrations with Piasecki HRP-1 helicopters have aroused keen tactical interest in helicopter assault landings. Apparently the Sikorsky H-19 is scheduled for further use in such tactics by both Army and Marines.

• **Anti-submarine warfare.** Use of the helicopter as an aerial platform from which submarines can be attacked has been the subject of tests by the Navy near Key West, resulting in the largest portion of the Piasecki HUP orders. Other HUP orders are for cargo utility work and for use as rescue aircraft.

• **Liaison.** The future of the smaller helicopters appears brighter now than it has in recent history. The Marine Corps has already replaced some of its fixed-wing liaison craft with small helicopters and Army shows new interest in helicopter liaison work.

There are relatively minor differences between requirements for trainer helicopters, liaison helicopters and observation helicopters for tactical aviation troop support, so that all of the small helicopter orders can be considered more or less interchangeable.

▶ **Commercial Effects**—Effect of the large new helicopter orders on commercial use of helicopters is expected to be generally good.

Two principal contenders for the New York area helicopter air mail and passenger market have indicated they would like to use civilian counterparts of the big Sikorsky, Piasecki and Bell machines on these routes. Availability

of these machines for commercial use may well be delayed by the large military orders.

However, it is understood that the military services are eager to get the benefit of high commercial utilization on the new machines as soon as possible, and may be glad to spare a few machines for airmail or other operations. Value of this experience on maintenance programs for the military services has already been well proven by Los Angeles Airways. On the basis of LAA's experience operating Sikorsky S-51 helicopters, service life of rotors, airframes and other components has been extended well beyond the original allowances.

LAA's three operational helicopters are now flying 6.6 hr. a day, six days a week. Some have logged 9 to 10 hr. a day.

Rotor blade life has been upped from a 1947 500-hr. limit to 2200 hr. In LAA's experience, main clutch overhaul period has been stepped up from 200 hr. to 480 hr. Similar deferments have taken place in other parts and assemblies. Even engine overhaul intervals have been doubled, from 500 to 1000 hr.

Advantage of such experience to the military, which ordinarily puts much less time on any one machine, is obvious.

The commercial airmail and passenger operators should be able to benefit from lower prices made possible by the quantity orders for the big helicopters, if and when they can get commercial deliveries.

Similar price reductions made possible by military orders presumably might make the use of small helicopters for crop-dusting and similar uses more economically attractive than it now is to most spraying and dusting operators.

Currently the helicopter is considered a high-priced agricultural machine, economical only on high-priced or special crops.

The bulk of spray work in the South and Southwest is still being done by fixed-wing craft, with hourly operational costs about one-third that of the helicopters now in agricultural use. But admitted advantages of an aerial spray platform which can hover if need be and which can operate out of very small areas are a strong inducement to agriculture. If additional military production of small helicopters helps get the price of the agricultural models down, watch for a new trend to rotary-wing craft for spraying and dusting work.

Versatile Bell

Versatility of the new Bell H-13D helicopter just ordered by the Army Field Forces is cited by the manufacturer. The 200-hp machine carries three persons in its cabin, and can be fitted with two litters to carry additional persons, or equipment. For short-range, assault transport work, it could carry five soldiers plus equipment. The new dual landing gear, which Bell developed last winter improves ground stability and prevents tipping in rough landings. It is understood Bell's order from the Army for this machine, estimated at $9 million for 90 copters—is the largest single helicopter order in the 1951 procurement program, and the largest since World War II.

Trainer Tests Off; Buying On

USAF can't wait on results of 'ideal' plane evaluation; it has too many students who need flight training.

By Ben S. Lee

The joint Air Force-Navy trainer evaluation program, barely started at Randolph AFB, Tex., has been halted. USAF Senior Officers Board has decreed that trainers must be procured immediately.

The advanced procurement timetable was made necessary by the stepped-up pilot training program.

The trainer evaluation, involving five planes (AVIATION WEEK Sept. 4, p. 15), was intended to determine ideal military characteristics of a trainer which could be used jointly by Air Force and Navy.

Decision of the Board will not be made known officially until Oct. 16. However, it is likely that the trend toward procurement of heavier trainers will continue. This will probably result in recommendation to procure trainers from:

- **North American**. Already committed to production of more than 600 T-28 trainers, North American will probably be asked for an additional number of these heavy, powerful trainers. In addition, conversion of the lighter wartime T-6 trainers to "G" series will be stepped up. The interim trainers are already undergoing conversion in sizeable numbers.
- **Fairchild**. When the Air Force was forced to cut to 48 groups from its planned build-up to 70 groups, scheduled procurement of the T-31 was dropped. Already acceptable to both USAF and Navy, the T-31 is also in line for a procurement contract.

U. S. trainers at Randolph ran the gamut in weight, engine power range, and size. Specifications included:

- **Beech T-34**. Wing span, 32 ft. 9 in.; length, 23 ft. 10 in.; height (tricycle landing gear) 9 ft. 7 in.; gross weight 2750 lb.
- **Temco T-35**. Wing span, 26 ft. 10 in.; length, 21 ft. 5 in.; height 6 ft. 4 in.; gross weight, 1920 lb.
- **Fairchild T-31**. Wing span, 41 ft. 4 in.; length, 27 ft. 10 in.; height, 8 ft. 9 in.; gross weight, 3000 lb.

Canadian entry in the joint evaluation was the de Havilland Chipmunk, and British entry was heavy trainer Balliol, said to have the same performance up to 15,000 ft. as the British Spitfire fighter.

- **Time Start**—Joint evaluation of the five trainers got off to a fine start approximately six weeks ago with the services set up to run a sophisticated series of tests. When correlated it would have provided specifications for an ideal trainer for all services. British and Canadian interest stemmed from the fact that in wartime a large number of their pilot personnel would be trained in the American plane resulting from the eventual design competition.

Decision of the Air Force to withdraw from the joint evaluation shelved the optimistic plan to develop a good trainer based upon requirements of the Air Training Command.

Remaining unresolved are two views: Whether to train fledgling pilots first in light aircraft and advance them to heavier planes as training progressed, or to start them immediately in heavier planes.

Adherents of the former method feel it more economical to begin initial training in light aircraft. The fledgling, it is claimed, solos in shorter time and at less cost to the government in the light plane. He is therefore easier to train after transition to heavier craft.

Advocates of the other method believe that while it takes longer to solo a student in the heavier trainer he has a more thorough grounding in pilot technique, because of the plane's greater weight and power, and as a result of more dual instruction.

- **Basic Specs**—Specifications used in setting up the joint evaluation were basic in nature. They provided only that the craft be two-place, capable of night and instrument flight, and that it have a range of more than 200 miles and an endurance of not less than 4 hr.

The months-long evaluation of trainers used by USAF, Navy, RAF and RCAF was originally scheduled to run for more

than a year at Randolph and at Navy's Pensacola Air Station. Plan was that all trainer entries would be flown by student pilots of USAF and Navy and that results of their training problems would be correlated into a future trainer design competition.

The plan, unique because of its implication as a step towards joint procurement and training methods, was being carefully monitored by the military and the industry. Whether the joint evaluation program of the two services is to be permanently shelved or temporarily deferred while bombing up the trainer inventory of the Air Force is still undecided, officers of both armed services say.

'Mobile Bases' Carry Navy Punch

Fast-moving aircraft carriers bring into bombing range areas claimed hazardous for land-based craft.

A. W. Jessup
(McGraw-Hill World News)

Aboard a U. S. Navy Aircraft Carrier in the Yellow Sea—Naval aviation is seeking a big comeback in the Korean War. From the admiral on the flag bridge to the ordinary seaman "horsing" Panther jet fighters around on the hangar deck, every Navy man is convinced that the "fast" carrier task force is an essential component of U. S. military power, and he is out to tell the world about it, too.

Its obvious that, for such a war as this, there is plenty to talk about. During four combat operational days on this cruise up and down the east and west coasts of Korea, carriers of Task Force 77 launched over 550 sorties against North Korean military targets, chemical and steel factories, fuel dumps, warehouses, railroad trains, electric power plants, transformer stations, troops, bridges, trucks and ox carts.

▶ **Mobile Airbases**—What the Navy men want to tell is the effective manner in which Naval aviation, with mobile airbases like this Essex class carrier, can carry bombs, rockets and ammunition deep behind enemy lines. This force, for example, has been four airbases by geographical location.

The first day it launched strikes from a point off the southern Korean coast in the Japan Sea; the next day we were far north of the 38th Parallel, only a little southeast of Chongjin (Seishin); after a day refueling at sea, the force entered the Yellow Sea for its third day of operations; today, these carriers were again north of the 38th Parallel but off the west coast for their fourth and final day's strikes against the enemy.

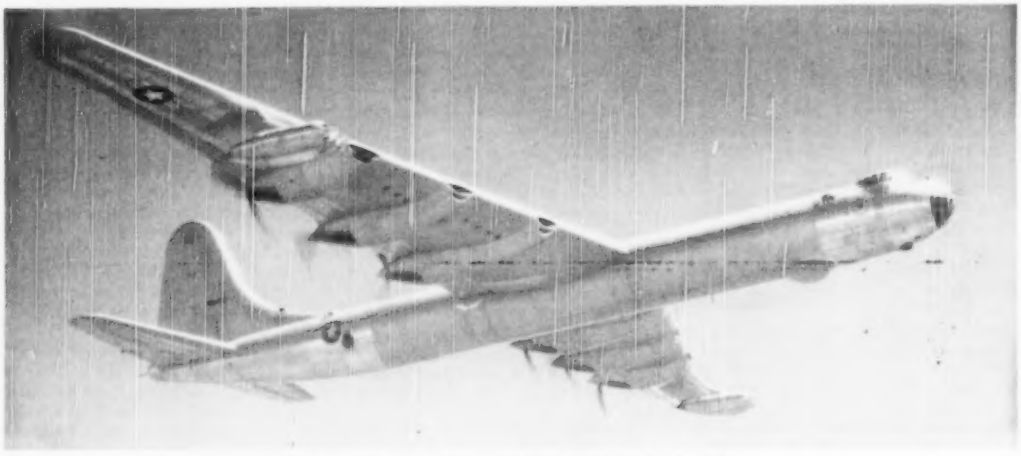
As far as the bombing is concerned, the Navy grudgingly admits it isn't doing anything which Air Force bombers couldn't do, or should be doing, as well and more economically from land bases in Japan. For this carrier operation is expensive. Besides the carriers involved, a dozen destroyers and a cruiser have been required in this force. Several other ships were needed to refuel and resupply the carriers with bombs, rockets and ammunition at sea so they could make four days of strikes instead of two before returning to fleet base.

▶ **Far-Ranging**—The Navy believes it has demonstrated that carriers can take bombers to areas so far distant as to be at hazardous bombing range for land-based aircraft and fighter aircraft within easy operational range of enemy shores. This is considered of critical importance in the Pacific region where the U. S. is unlikely to have continental air bases and may have need to supplement its island bases.

Of primary importance is the successful operation of jet aircraft for combat from a carrier. Each carrier carries a jet squadron. These are a lot of trouble operationally, since another type of aircraft is jammed into already cramped quarters. But only the foolhardy, according to the experienced pilots, would want to shuck the jets. These are a needed insurance against potential enemy air opposition.

Only the F9F-3 Panthers are in action. The Navy's Washington publicists gilded the Panther recently by releasing some phenomenal statistics as to what ordnance it has carried into combat. Actually, the Panthers are toting only their 20mm. cannon for strafing attacks against supply dumps, railroad trains and troop concentrations.

The Panthers are equipped to carry six five-inch rockets. After the first few days, no rockets were carried. Two Panthers, carrying two rockets, dropped into the sea because the catapults aren't adequate to put this weight in the air with the boost it needs to stay airborne. Two other craft were stopped on the flight-deck edge when catapult cradles broke.



B-36D PROBES THE WILD BLUE YONDER

Convair's B-36D, embodying all the latest modifications including outboard jet pods, is photographed at high altitude. Increased USAF procurement has resulted in additional undisclosed orders for the long-ranging strategic very heavy bomber. All B-36s already in service are being modernized to the D's standards. Total of over 40,000 hp. gives top speed of over 435 mph. above 40,000 ft.

▶ **Skyraider Tops**—Main burden of the Navy air strikes is carried by the AD-3 and AD-4 Skyraiders and the F4U-4 Corsairs. These are the primary weapons against ground targets because they carry bombs and rockets. Pilots rate the Skyraider tops of all the Navy's dive bombers. One squadron commander said, "This is the plane we asked for in World War II and got the SBD instead. Now we have it and it's almost outdated."

For the Korean-type war, both Corsair and Skyraider are excellent. They can take heavy payloads to the target areas. Major enemy air opposition, especially jet-propelled types, would drastically change the story. The air admirals say it would then be suicide to send them out against the enemy.

Rear Admirals E. C. Ewen, Commander Task Force 77, and George R. Henderson, Commander Fleet Air Japan, believe that it won't be long before the Navy will have an all-jet carrier, except for a few special-mission types. Among the latter would be a number of conventionally powered submarine search and reconnaissance aircraft.

There are some important lessons being learned with the Panthers.

• **Powerful catapults** are needed to put the heavy jet up. These must be able to get jets off with a full load of ordnance, including bombs up to 1000 lb.

• **Deck reinforcement** is essential. With the Panthers, the decks of the Essex class carriers are at their limit of stress. The pounding when a Panther comes in at about 120 knots, and is literally flown into the deck, is terrific. At least one of the carriers out here may have to be redecked soon on the stern.

• **Heavier elevators** may be needed. These, too, on the Essex carrier, are at their limits of stress lifting the Panthers. As the Navy develops jet aircraft to do the job now being done by the Skyraiders, it is expected that the aircraft weight fully loaded will increase to 25,000 lb.

• **Simplification of the jet engines** will help maintenance, and keep aircraft availability near where it should be for combat. Maintenance engineers want to remind the aircraft industry that the first claims for jet development were that it would simplify all maintenance problems. So it was at the beginning. Now they claim to be plagued by a maze of automatic equipment and devices and a maze of micro-switches and solenoids. Heavy jet aircraft pounding into the carrier deck knock these out of whack.

This automatic equipment is designed to increase the safety factor. But there is a school which believes this goes too far, that the pilot becomes so dependent and reliant on automatic gear he forgets a lot he knows about flying, gets his mind off his business, resulting in no appreciable change in the safety factor. But it does increase the maintenance burden.

The biggest unsolved problem is how to conduct accurate bombing at the high speeds of jet aircraft. Speed has no effect on the accuracy of cannon and rocket fire. In fact jets are a more stable artillery platform than conventional planes. But at their high speeds, jets are poor bombing planes. A solution lies in either finding some way of slowing the jets down for their bombing dives or an electronic sight calculator rapid enough to compute and release the bombs. There's no problem designing a rapid sight calculator, but it would be far too bulky and heavy to be airborne.

CAA War Plan

Program provides wartime control of private pilots and civil airports.

Donald W. Nyrop, new CAA Administrator, will continue to push recommendations for a coordinated state-federal program to utilize U. S. civil aviation in event of a war emergency.

Nyrop will pick up where his predecessor, Delos W. Rentzel, now chairman of CAB, left off in the emergency plans. He indicated as much in his first address as Administrator, before the Northwest Aviation Planning Conference International Northwest Aviation Council meeting at Sun Valley, Idaho.

The plans proposed by the Advisory group, headed by George Haddaway, Dallas, were compiled from suggestions submitted by various aviation organizations and individuals throughout the U.S. A plan proposed by 12 aviation organizations served as a guiding framework (AVIATION WEEK Aug. 21).

▶ **Identification System**—First recommendation expected to be activated (as indicated in AVIATION WEEK Sept. 4) will be an identification card system for all civil airmen, based on proof of identification, place and date of birth, citizenship and a loyalty pledge.

Airport ground personnel are expected to have similar identification, but airport operators are expected to be given the authority to clear ground personnel for temporary service pending completion of identification.

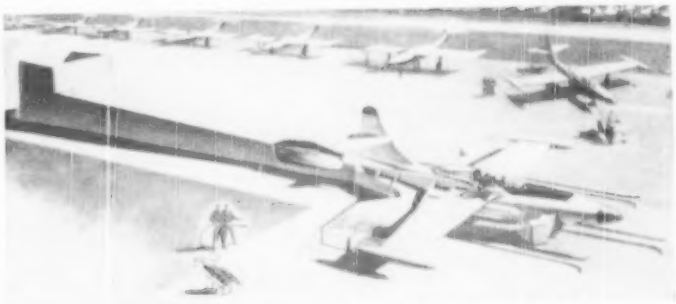
Registration of aircraft, on forms prepared by CAA but distributed and administered at the state and local level by state defense councils, is also called for.

▶ **Control Airports**—The designation as "control airports" of field meeting uniform security requirements, is recommended to be put into effect in most cases only in total emergency. But the criteria governing such a designation should be set up and circulated within industry, in preparation for such a plan. All airports meeting the criteria and able to perform the security controls, should be granted the designation, the committee has recommended.

Essential prerequisites for a control airport are suggested as: Telephone; suitable office for safekeeping of records, maps, notices and aircraft register; available qualified personnel; 24-hr. aircraft security; radio facilities if needed.

The control airport would be expected to maintain a register, charts, directories, and information regarding restricted areas and other security requirements, for proposed outbound flights; maintain records of planes and owners, and post or comply with security directives.

Establishment of some control airports within "military sensitive" areas may be desirable in conditions short of total emergency, but careful evaluation



NORTHROP BUILDS ENGINE NOISE MUFFLER

Under construction at Northrop Aircraft's Hawthorne, Calif. factory is this noise muffler to reduce sound levels of F-89 Scorpion's GE J-47 engines being pre-flight tested. Walls of the Muffler will be made of porous volcanic ash blocks, with heavy steel I-beams reinforcing the structure. The unit will be about 95 ft. long, with width tapering from 10 to 16 ft. A 40-ft. wide shroud extends across the front of the muffler for placement of the aircraft. Escaping gases will be deflected upwards.

and justification for establishing such control airports in advance of a total emergency is recommended, with a screening board of government and industry members to pass on the requirement.

▶ **Some Waivers**—It is asked that waivers be set up for continuation of agricultural airplane use, and patrol flying along fixed patrol routes, such as pipe line or power line patrols, with the understanding that the operators of such planes keep a complete operations log available for inspection, and that suitable provisions for recall of aircraft be made if required.

Administrator Nyrop is asked to recommend to governors of states and territories that each governor appoint a qualified person from the state government to represent civil aviation in the state civil defense council.

This individual, with the help of a state advisory committee representing civil aviation, including scheduled airlines, is then to take the following steps:

- **Inventory nonscheduled** aviation equipment and personnel in the state.
- **Direct aviation security** measures in the state.
- **Plan for uses** of aviation facilities in the state.
- **Supply details** of the inventory and aviation plan to local civil defense units.
- **Serve as liaison** officer between state, federal and local units on aviation resources.

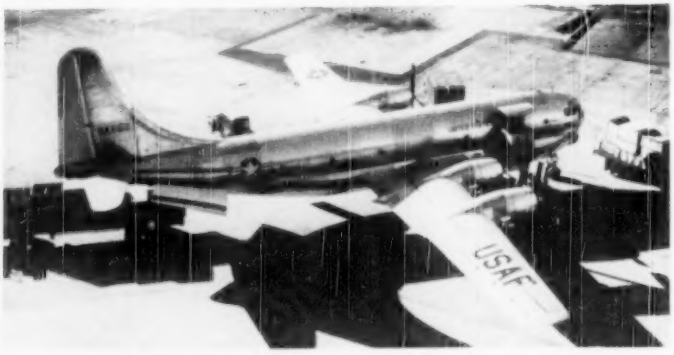
Committee recommendations called for encouragement of installation of two-way radio on all planes which might fly cross-country, and encouragement of all airmen to obtain FCC licenses permitting use of aircraft transmitters.

▶ **Transfer to VHF**—Air-to-ground transmission on VHF channels assigned by FCC to itinerant aircraft, was urged, instead of the old HF channels which have heretofore provided the primary air-ground communication channels.

Installation of VHF automatic direction finders at all surveillance radar installations used in aircraft identification and plotting functions was urged. (CAA is now procuring its first 44 such units.) It is assumed that all planes not equipped with two-way radio probably will be grounded in any period of total emergency.

Other planning recommendations:

- **Compensation scale** should be established for long-time use of civil planes and pilots in emergency.
- **Deferment plan** for civil aircraft, on an essential-need basis.
- **Declaration** of policy that surplus World War II airports will be reactivated before the military services take over civil fields, and that joint civil and military use of civil airports will continue until full capacity of a field is needed for military planes.
- **Emergency authority** for operators of air taxi and charter service to operate planes on a "jitney basis" between home base and cities within a 300-mi. radius with no limitations during the mobilization period, on frequency, scheduling or advertising of such short-haul flights.
- **Granting CAB authority** for additional feeder routes using non-air carrier type planes, with extension of certificates to five years, to further augment civil airline transportation, in the event it is curtailed for military uses.
- **Utilization of civil aviation's** overhaul and repair base facilities to a greater extent to maintain military planes.
- **Manufacture** of sufficient spare parts to keep the civil aviation fleet in service during the war emergency.



STRATOFREIGHTER LOADING SPEEDED

Addition of another cargo-personnel door on the right side of the Boeing C-97A's upper deck gives the huge USAF transport a total of four doors, cutting loading and unloading time to two-thirds that previously required. Other doors are located under the tail and in two lower-deck locations on the left side. The Stratofreighter is capable of handling 33,000 lb. of cargo, or 130 troops, or 79 litter patients plus medical personnel and supplies. During August, eight Pacific division MATS C-97's logged 1028 transport hours. Boeing is working on additional contracts for the Stratofreighter.

CAB Order Raises Air Coach Rates

Regular air coach operators will have to charge passengers ½ cent more a mile, beginning Nov. 16, the Civil Aeronautics Board has ruled. The Board sets the standard coach minimum at 4½ cents a mile, compared with today's prevailing rate of about 4 cents on most routes.

The Board has also extended permission to run coach services that were to expire Sept. 30. Permission extends the period to Mar. 31, 1951.

But the lines must continue to schedule air coach trips in off-hours, the Board says.

CAB decided "after a thorough study" that the 4-cent fare was too low—that the increased volume did not make up for the diversion from first-class travel. It decided that 4½ cents would bring the lines a better overall profit.

The statement of the Board put it this way: "The large proportions of coach traffic moving over segments where the service is offered, substantial diversion of traffic from standard fare services, and the importance of maximizing revenues on these segments to counterbalance lower revenues on segments of lesser traffic density form the underlying reasons in support of this conclusion."

▶ **Exceptions**—The Board will allow fares under the 4½-cent minimum in certain special cases, where there are "special conditions or circumstances."

One such exception is Western Air Lines' Los Angeles-San Francisco fare of $9.95, or about 3 cents a mile. This the Board permits because of competitive conditions. Intrastate carrier California Central has a 3-cent fare on this run. Since the Board does not control tariffs of intrastate carriers, it allows Western to meet the competition in this case.

In the same action as the 4½-cent ruling, the Board suspended indefinitely National's proposal to inaugurate daylight nonstop DC-6 New York-Miami coach service. This ends for a while National's long fight to get that tariff, opposed ceremoniously by Eastern Air Lines.

▶ **Fares Up**—The CAB ruling means most coach fares will go up on Nov. 16. Main exception is on the transcontinental runs already charging around 4½ cents a mile.

Here are some effects of the Board action on several important coach services:

- **Eastern's coach fares** run around 3.9 cents a mile on heavy-density routes. The New York-Miami fare of $47.50 (3.85 cents a mile nonstop) will have to go to $54.55, under the new ruling.

• **National's** President G. T. Baker protested vigorously on hearing of the Board's fare-raise order. Said Baker: "the objective of National Airlines, and we thought CAB, has been to develop lower fares.

"National has been in the air coach business since last November and has consistently made money at the 4-cents-a-mile fare. We see no reason for requiring an increase to the basic fare of 4½ cents, particularly since the CAB allows irregular airlines to advertise fare as low as $55 between New York and Miami."

• **Trans World Airlines** and other scheduled transcontinental routes are unaffected by the CAB rule because their rates are already about 4½ cents a mile.

NWA Dividend May Stir Senate Action

Announcement of a $325,000 preferred stock dividend by Northwest Airlines may touch off a Senate investigation.

The dividend action was announced shortly after a statement to the Fulbright subcommittee by Richard Hellman, former consultant to the reconstruction Finance Corp., alleging that Northwest has been overpaid $3 million in mail compensation on its overseas route over the past three and one-half years. Subcommittee investigators are now looking into the matter.

The Board issued a show cause order, being contested by the carrier, reducing Northwest's overseas mail pay rate, effective Aug. 1. "This would seem to be incontrovertible evidence that it should have been cut backward as well," Hellman declared. "If the sum in the magnitude of $3 million of recapturable mail pay is permitted by the CAB to be carried on the books, it would become possible for the company to pay dividends out of fictitious earnings."

Hellman made this prediction Aug. 21 to the committee, well in advance of the announcement of the dividend. His testimony was released to AVIATION WEEK by the committee last week.

Hellman vigorously opposed a $12-million loan guarantee by the RFC to finance Northwest's purchase of ten Boeing Stratocruisers in the spring of 1949. He contends that the Board, because it approved the RFC guarantee, is now in a face-saving position and under "moral obligation" to "bail out" Northwest to justify its own action. He maintains that the Stratocruiser is an uneconomic plane for Northwest's thin traffic routes.

This, and not the cost of breaking in the plane, he declared, is the major cause for record losses by the carrier this year. He reported Northwest lost $5.6 million the first quarter of the year, compared with a loss of $1.3 million for the same quarter last year, and that in the second quarter it "just broke even," compared to an earning of $1.9 million for the same period last year.

The reason for the Board's leniency in not cutting the mail pay retroactively, Hellman contended, was an effort to save Northwest from undergoing a financial crisis. But the Board and its staff did not anticipate that Northwest would pay out almost a third of a million dollars in dividends.

SEC Reports Stock Transactions

Sale of 2000 common shares of Grumman Aircraft Engineering Corp. stock by L. R. Grumman, chairman of the board, leaving a holding of 80,500 shares, is reported in Security and Exchange Commission's latest stock transaction report.

Other aviation transactions reported for the mid-July to mid-August period included:

• **Air Associates, Inc.** Sale of 200 common shares by Gilbert Colgate, director, leaving a holding of 13,348 shares.

• **Airlects, Inc.** Purchase of 1300 common shares by Oswald Johnson, director, making a total holding of 1200.

• **Avco Manufacturing Corp.** Purchase of 200 preferred shares by Walter Mugeson, director, making a total holding of 900 preferred, 1100 common, and options for 20,000 common shares.

• **Boeing Airplane Co.** Purchase of 300 common shares by William Allen, director, making a total holding of 1957 shares; acquisition of 234 common shares by Fred Landan, director, making a total holding of 1119 shares; purchase of 200 common shares by Dietrich Schmitz, director, making a total holding of 1000 shares.

• **Capital Airlines.** Purchase of 100 common shares by James Austin, officer, making a total holding of 5800 shares; acquisition of $13,000 in four per cent debentures by George Hann, director, making a total holding of 12,900 common shares and $273,000 in debentures.

• **National Airlines.** Purchase of 700 common shares by Joseph Merrick Jones, director, making a total holding of 6300 shares.

• **North American Aviation, Inc.** Purchase of 200 shares by Alden Roach, director, total holding.

• **Pan American World Airways.** Sale of 800 capital shares by William Bond, officer, leaving a holding of 1223 shares.

• **Republic Aviation Corp.** Purchase of 200 common shares by Frederick Cabana, director, total holding.

Holdings by new officers, directors, and owners, were reported, as follows:

• **Airlects, Inc.** Atlas Corp., beneficial owner, 45,240 common shares; George Lask, officer, six common shares; William Rockefeller, director, 48 common shares; C. C. Stratton, officer, five common shares; Lawson Birkett, officer, no holding; Floyd Gilliam, officer, no holding.

• **Boeing Airplane Co.** T. O. Yeatting, officer, 231 common shares.

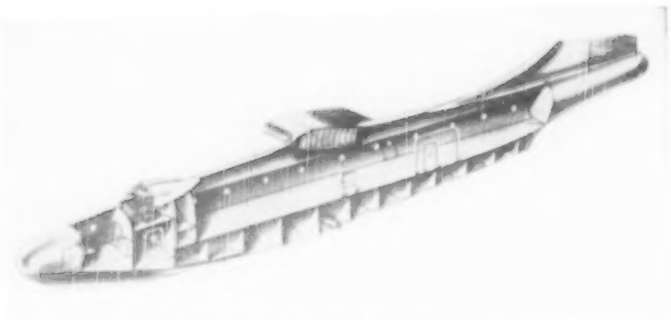
• **Glenn L. Martin Co.** Jess Swetzer, officer, no holding.

• **Republic Aviation Corp.** Henry Lehne, officer, no holding.

IATA Sets Up Policing Body

A "police force" has been set up within the International Air Transport Assn. to see that member airlines stick to IATA traffic conference rules approved by the interested governments.

Investigation of violations will be handled by a newly set up enforcement section, headed by Rudolph Frick, which goes into action upon a complaint from a conference member or the discretion of the director general. Members are bound to furnish IATA with full pertinent information.



CONVAIR BARES THE R3Y

Last details of the hull interior of the R3Y-1, cargo version of Convair's new turbojump flying boat, points up the below-floor-level water-tight integrity. Also noteworthy is large expanse of obstruction-free floor space, which should permit high payload factors. The Navy has ordered an undisclosed number of the 80-ton craft, which will have a top speed of over 350 mph. and can be fitted out as troop carriers, air ambulances or passenger liners. Four Allison T-40 turboprops turn eight-bladed Aeromatic props.

PRODUCTION

West Coast Plant Wage Hikes Seen

IAM and UAW seem to agree that plane makers should pay increases of about 31 cents an hour more.

In the current round of bargaining, Los Angeles airframe builders would like to settle for a 5-cents-an-hour blanket increase. But recent developments indicate they'll have to go higher, perhaps much higher.

The club being swung by the unions is the $1.94 contract won at Bendix. Aircraft average wage in Los Angeles is $1.655 an hour. Spokesmen for three manufacturers told AVIATION WEEK they thought a 5-cents-an-hour increase would suffice. But events seem to deny it.

▶ **IAM Asks More**—The International Association of Machinists struck the Menasco Manufacturing Co. at Burbank though the company offered increases that would have averaged 14.9 cents an hour. The union sought 30 cents an hour more pay plus 8 cents for fringe issues. The company offered 11 cents more pay plus 3 cents for fringe issues. The company included a reclassification program that would have brought the average increases to 14.9 cents an hour. Menasco settled with the union by agreeing to pay raises averaging 17 cents per hour.

North American has sweated out ten meetings since it opened talks with the United Auto Workers (CIO) on Sept. 5 and the union hasn't backed down an inch from its original request for 20 cents for wages and 11¼ cents for health insurance.

The company has offered to meet the wage increases granted in the auto industry but not to raise aircraft wages to the auto level. On the basis of the 7 to 8 cents increase in the auto industry, a 5-cents-an-hour increase is indicated in the aviation industry, a North American official said. He said the company offered to stand the major cost of added group insurance, also was talking of a pension plan. The union has yet to act on these last proposals.

▶ **Sitting Tight**—Meanwhile, the rest of the industry probably will sit tight until the outcome of the negotiations at North American, though all have been approached to reopen contracts, and talks have actually begun at Lockheed Aircraft Corp.

These wage talks at Lockheed, Douglas, Northrop and others will be on a voluntary basis since only North American has a reopening clause. Present contracts have a year to run.

But because of the strong rivalry between the two unions, the IAM can be counted on to exert considerable pressure on companies it deals with should the UAW show marked success at North American. IAM represents the bulk of the industry except North American and Douglas Long Beach plant.

The size of the increases asked of Lockheed by IAM local 727 are as yet unknown. Union and company officials have said it would be "considerably less" than the 31¼ cents asked at NAA. But others insist the union is asking for 31 cents. And in the bargaining game of follow the leader this seems plausible.

PRODUCTION BRIEFING

▶ **North American Aviation** will pay employes taken into military service prorated vacation and sick leave allowances for each full month of continuous service since their last anniversary date with the company.

▶ **Dommers Co.**, Old Saybrook, Conn., is a new firm with production facilities for handling aircraft components, light assemblies, test equipment, contract machining, metal stampings, tools and jigs, and welding. Development engineering is also offered. President and general manager is Walter A. Dommers, formerly director of field engineering for Revere Corp. of America.

▶ **Alloy Precision Castings Co.** has purchased the precision castings business, facilities and license rights of National Bronze & Aluminum Foundry Co., Cleveland. New management is headed by David Thomson. Entire operating personnel of National Bronze has been retained, with William L. Neumeyer, former National Bronze president becoming vice president of the new concern and heading up the company's sales program.

▶ **William R. Whittaker Co., Ltd.**, has purchased the hydraulic valve division of Hansen-Lynn Co., Inc. This is the second move Whittaker has made in this direction. In April the company acquired the entire capital stock of Saval, Inc.

BOEING TRIES A DUTCH MASTER

This is an Entoce black-and-white duplicating machine used in Boeing Aircraft Co.'s blueprinting department, Seattle plant, to aid engineers in thrashing out technical problems. Should an engineer have a stickler he wants to show his colleagues, he draws it on an 8 x 11¼ in. sheet of translucent paper and letters appropriate explanations. The Entoce can turn out up to 1200 duplicates an hour, requiring only a single operator. The machine, installed by Charles Bruning Co., Inc., Chicago, is said to be the only one of its kind, and was made for Bruning by Chemische Fabriek L. Van der Grinten of Venlo, Netherlands.

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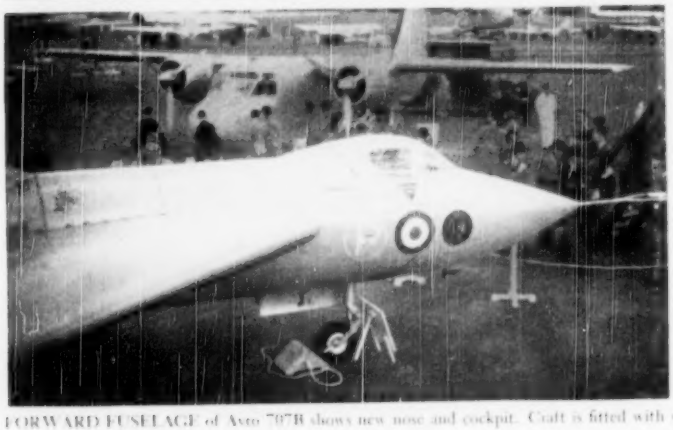


FORWARD FUSELAGE of Avro 707B shows new nose and cockpit. Craft is fitted with spin chute, has increased vertical fin area.

Avro Shows Second Delta Research Craft

Derwent-powered 707B, for planned exploration of subsonic flight speed range, has low wing loading, no flaps.

Examining an airplane in detail only shows the tangible parts, the end products of the basic design. For explaining the intangible philosophies behind the configuration, only the designer can be of help.

To complement the inspection of the Avro 707B, delta-wing research aircraft, AVIATION WEEK interviewed Mr. S. D. Davies, head of Avro's design team. Davies is responsible for the 707 series whose appearance at Farnborough on two successive years practically stole that show.

This analysis of Avro's 707B is put together from the notes of that interview and from first hand impressions of the aircraft.

By David A. Anderton

Manchester, England—Late in the second afternoon of the SBAC of British Aircraft Constructors' recent show, Avro's sky-blue, delta-winged 707B research craft blasted round the Farnborough pattern. It came in over the fence for its landing, touched down ("Flatter than a firecracker!" said one observer) and shortly after deployed its spin chute to help brake its fast run. At the end of the 6000 asphalt runway it turned, and taxied back to its assigned place in the static park.

During the remainder of the SBAC display, it just sat there—but it attracted almost as many spectators as the gigantic Brabazon on the other side of the field.

Why? Well, for one thing, there is always an air of mystery about a plane which is built specifically for research purposes. (Avro contributed to the aura of mystery by the last-minute appearance of the plane.) And for another thing, there is all sorts of talk about it being a prototype for a multi-jet bomber that Avro is building. (It isn't, exactly.)

And for a third, it is such a sweet looking airplane, with such a perky appearance in the air, that it just naturally attracts people who want to see what it looks like close up.

▶ **What It Is**—The 707B is the second in a series of delta-wing research aircraft being built by A. V. Roe & Co. Ltd., Manchester, England. (First 707 was shown in SBAC's 1949 display, but crashed shortly afterwards.)

Basic plan of the series is to explore the flight capabilities of the delta configuration over a wide range of speeds.

Wing span is 33 ft., leading edge is swept back at an angle of about 52 deg. With a root chord measured as 22 ft. at the fuselage centerline, the wing area works out to about 363 sq. ft.

Fuselage is a modified cylinder of 4.3 ft. basic diameter. The pointed nose mounts a long boom for pitot head and possibly a yawmeter. Pilot sits in the conventional place under a canopy which affords no visibility to the rear or above, and very little to the sides. Forward vision appears to be adequate.

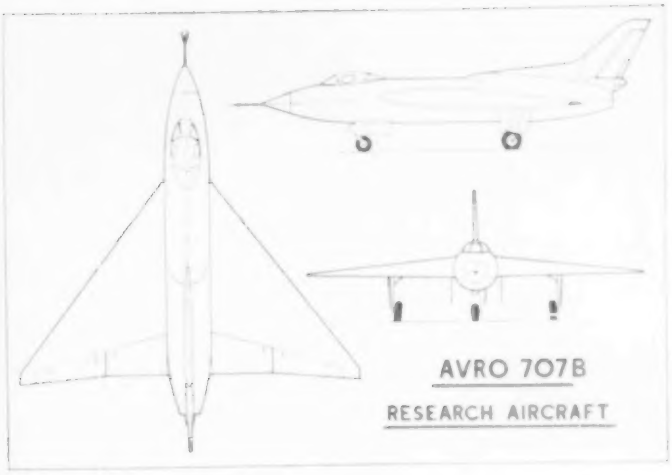
The Rolls-Royce Derwent turbojet which powers the 707B is mounted aft in the fuselage. An inlet for the engine is on the upper aft surface of the fuselage, and is split down the centerline by the vertical tail structure.

Leading edge of the vertical tail is very sweptback; the angle appears to be about 50 deg.

An anti-spin chute is fitted in a fairing above the jet exhaust. It is not normally intended for use as a braking tail, but probably will be deployed on landings to save the 707B's brakes until techniques of slower landings have been developed.

▶ **Proven Parts**—A prime consideration in the design of the original 707 and its replacement, the 707B, was a rapidly approaching first flight date, which was timed to enable the airplane to be shown at Farnborough. Whenever possible, proven parts from other Hawker-Siddeley aircraft were incorporated directly into the design. Thus, the main landing gear came right out of the Avro Athena stock room. And the nose gear is from Hawker's beautiful little P.1081.

And incidentally, the use of Athena main gear gives a hint as to the weight class of the 707 series. Athena gross weighs 8000 lb. gross weight, but obviously lands more slowly. Allowance for this and for the proximity of designer



to use bomb manuals for wing loadings, it would seem that somewhere around 7,000 lb. is a good estimate for the 707B gross weight.

The device to get the plane quickly into the air explains the poor shape of the air inlet, too. Such a high, aft location is not good medicine for a jet engine, which likes to be pampered with a steady air supply. The inlet on the 707B is definitely of low efficiency—it has a poor configuration, no ramps, no boundary layer bleed, and probable no flow at high fuselage angles of attack.

But at the moment there just wasn't any place else to locate it. The inlets couldn't be made symmetrical above and below the fuselage, because the belly of the fuselage was filled with lines and wires. The purpose of the plane was to test a wing form, so Avro preferred not to clutter up the wing leading edge with air inlets. Physical size probably ruled out the nose inlet on the fuselage.

So much for basic data and the appearance of the 707B. Now for some of the philosophy which governed the design of the 707 series.

▶ **Subsonic Explorers**—The Avro 707 and 707B were intended as strictly subsonic aircraft. Their single purpose is to explore the flight speed range below sonic as it pertains to the capabilities and problems of the delta wing configuration.

It is obvious that Avro built these airplanes for experience. And there is a purpose behind the choice of configuration.

There has been so much unofficial-official talk about Avro's delta-wing bomber both here and abroad that one has no choice but to believe that the 707 series is intended to obtain background data for Avro's bomber work. But don't expect Avro's delta-wing bomber to look much like the 707B except for the wing shape.

▶ **Internal Cubage**—The thick wings on Avro's delta-winged craft can carry internal stores, in contrast to even thin wings in current U. S. details. And since the designer has made up his mind to use the available cubage within the wing structure, he's decided on a low wing loading (a current British fetish) and knows the speed range he is expected to supply, then he has got about fixed his layout.

There is another factor born of the low wing loading in the 707B design. The airplane needs no landing flaps and has none. And the delta are almost nulled the large trim changes which occur when flaps are added to a delta wing. No flaps, no trim changes, no problems.

▶ **Some Changes Made**—There are some obvious differences between the 707B and its predecessor, the 707. And many of these differences arise out of a single new feature in the design—an ejection seat.

As a result of their flight experience with the first 707, Avro decided that an ejection seat was a must for the second plane. But incorporating the seat meant redesigning fuselage, cockpit, canopy and vertical tail.

Fuselage lines were widened forward of the leading edge of the wing to accommodate increased dimensions of the ejection seat. In order to preserve aerodynamic lines, the nose was extended somewhat more than 5 ft.

Windshield was changed in style from three flat pieces to a flat front with curved side sections; the canopy behind it became metal with a small Perspex panel in each side, instead of the five-piece, one-piece Perspex canopy of the 707.

Increased nose length meant added lateral area ahead of the aircraft center of gravity, which meant less effective fin area and lowered directional stability. Additional fin area was added at the top of the vertical tail to compensate for this effect.

Comparison of drawings of the 707 and 707B add a few less obvious differences. First, geometric dihedral has been changed from zero to −2½ deg.

Second, the aft fuselage lines have been altered from those of the 707 to give a cleaner look to the 707B.

Third, the shape of the nosewheel doors has been changed, a detail probably explained by the change in forward fuselage lines when the ejection seat was added.

▶ **End of the Obvious**—That's about as much as is obvious in looking at, or talking about, Avro's 707B. What we can't see behind the locked doors at the Chadderton plant is the correlation between these planes and the Ashton (Avro's high-altitude, four-jet research aircraft) and the forthcoming bomber.

But the betting is that it won't be long now until that correlation is apparent. And when the time comes, if any aircraft can wear an I-told-you-so look, it will be the tiny blue 707B.

Dunlop Plans Parts Plant in Australia

(McGraw-Hill World News)

Melbourne—A big aircraft parts factory is planned by Dunlop Rubber Australia Ltd. at Rayswater, near Melbourne. The project is designed to back up the government's program for production of latest types of jet aircraft. Wheels, brakes, hydraulic and pneumatic actuating mechanisms and other components and accessories developed by the firm in England will be among the items produced.

Dunlop has bought a factory site of 50 acres and expects to employ 300 on the project.

Lockheed Boilers

Two new boilers, capable of generating over 80,000 lb. of steam per hour, have been placed in operation by Lockheed Aircraft at Burbank. The boilers, as designed to provide the plant with standby emergency power.

More than four miles of water tubes run through the boilers, which can convert 50 gal. of water per minute into steam at capacity operation. One man, using automatic controls, can operate the entire system. Either fuel oil or gas can be used, depending on the supply potentials of either fuel.

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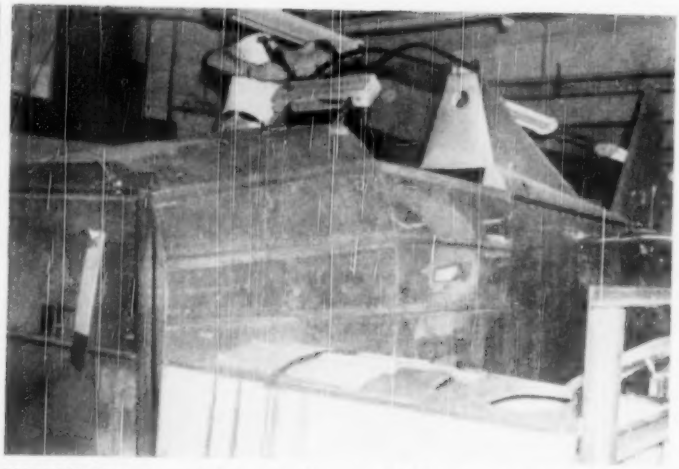


RUGGEDNESS and simplicity keynote this new experimental duster and sprayer craft now being constructed under the Texas A. and M. College's agricultural aviation project. Middle portion of fuselage skin carries external stiffeners. Spray tank opening is seen near end of deep, center wing panel. Wing leading edge is detachable.

Sprayer-Duster Designed for Job

Experimental, all-metal workhorse incorporates utility concepts gathered in wide operator survey.

By Irving Stone

The agricultural plane finally has "grown up." When the brand new, "custom-made" configuration is brought out later this year at the Personal Aircraft Research Center of the Agricultural and Mechanical College of Texas, the sprayer-duster will pass from a "hand me down" status to one of its equipment maturity.

The new experimental craft won't be a panacea to answer all the design requirements desired by the various operators—the field covers too large a range to be handled by a single type.

But it will be the first modern "flying farmer" designed from the landing gear up specifically for its role—a medium-size job intended to be representative for a substantial portion of work, so that subsequent development and experience can be applied to larger or smaller craft.

▶ **Made for the Job**—Concepts of utility designed into the plane are no bid, or more variety—they are the crystallized ideas of the man in the field. CAA's Office of Aviation Development and its regional offices picked the brains of operators in a nationwide survey. And the data were supplemented by personal interviews with operators.

The project was begun because it has been realized by designers and operators alike that a better agricultural plane long has been overdue.

Sponsoring this much-needed research program are the National Flying Farmers Assn., Civil Aeronautics Administration, U. S. Department of Agriculture, and the Texas Agricultural and Mechanical College System.

Heading the work at college's Personal Aircraft Research Center, where the craft is now under construction, is the wellknown Fred E. Weick, former NACA engineer and designer of the first mass-produced spin-proof plane—the Ercoupe.

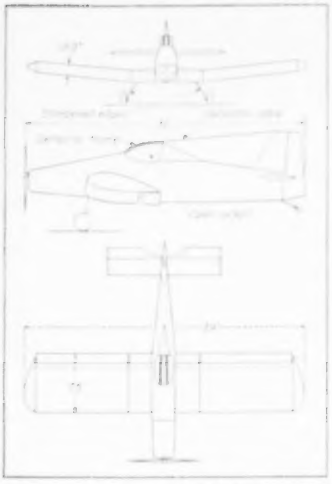
The project has been divided into three main parts:

- **Development of a plane** having the characteristics desirable for maximum effectiveness when used for agricultural purposes.
- **Development of equipment** for more effective distribution of materials—seeds, insecticides, fungicides, herbicides, fertilizers.

Construction of the craft, under CAA contract, is about 70 percent complete. Static strength tests representing air loads have been made on tail surfaces and will soon follow on wing and fuselage.

About 28 technicians are engaged on the project, working two shifts.

▶ **Contributions for Plane**—Industry and agencies have shown a keen interest in the development of the plane and have contributed this support: Texas Engineering Experiment Station, salaries,



Three-view showing general characteristics of the experimental configuration.

Civil Aeronautics Administration, general expenses, personnel expenses, salaries, U. S. Department of Agriculture, salaries; Aeronca Aircraft Corp., salaries and engineering service; Continental Motors Corp., engine; Cessna Aircraft Co., landing gear and engineering service; U. S. Rubber Co., three tank liners; Goodyear Tire & Rubber Co., wheels, brakes, tires; American Seating Co., inertia reel; Vic Pastushin Industries, Inc., adjustable seat; McCauley Propeller Co., one-piece propeller; Koppers Co., Aeromatic propeller; Aircraft Conversion Co., instruments and hydraulic equipment.

▶ **Help for Distribution**—Initial flights will be followed by further development of flight characteristics and distribution equipment.

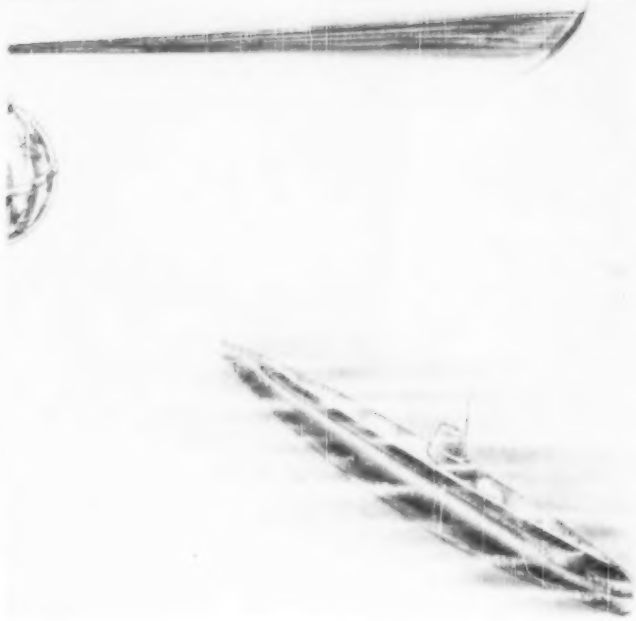
The Texas Agricultural Experimental Station has chipped in $2,000 for distribution studies with the plane. And a test setup is being established for direct measurement of distribution by weight, and work is going on to develop a simplified approach to this problem.

The National Advisory Committee for Aeronautics' role is to make tests on a catapulted model to determine the flow in the plane's wake to throw some light on its effect upon distribution.

▶ **All-Metal**—Basically, the craft is a rugged, simple, low wing configuration.

Many small operators prefer a steel tube and fabric-covered structure because they have facilities and experience to repair this makeup. But larger operators have facilities for metal repair, which they feel can be done as quickly and cheaply as fabric work. Also, the metal structure has more impact, weathering, and fire resistance.

Because of these factors and the trend toward metal makeup, the experimental



DESIGN FOR DEFENSE

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Winner of the Navy's recent anti-submarine helicopter competition—was Bell Aircraft, with a design which incorporated important advances developed during a decade of pioneering, engineering and manufacture of rotary wing aircraft.

Bell helicopters are veterans of military service, by all arms of the Defense Department. The Navy has HTL-1s, HTL-2s and HTL-3s for everything from weather investigation to torpedo spotting. Furthermore, it has assigned helicopters to the Marines for liaison and observance work and to the Coast Guard for patrol and rescue missions. The Air Force, the Army Field Forces and the Corps of Engineers also find a multitude of uses for Bell Helicopters.

Back of the achievements of Bell helicopters are 10 years of development, experimentation, testing and product improvement—and more than 100,000 hours of flight time in actual field operations in the United States and 29 foreign countries. The record of these helicopters "in the service of the services", and in other fields of aviation is significant of the high level of Bell Aircraft design and performance.

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plane will be all-metal, with sheets of single curvature, relatively easy to repair in the field.

▶ **Wing**—Airfoil is an NACA 64021 section. The rectangular planform has a relatively large area. Tapering tips are detachable. Span is about 39 ft., comprising a center section and two outer panels. Basic chord is about 7½ ft., thickness ratio, 21 percent. Flaps will be full span. Low placement of the wing will increase downwash effect and provide better coverage and penetration.

▶ **Empennage**—Horizontal tail planform is rectangular, with elevators cut back as they approach the vertical tail.

Rudder will be unbalanced when the plane is flown initially.

▶ **Fuselage**—This is a squarish structure, except for the curved deck, with about a 30-ft. length.

Nose houses a 200-hp., horizontally opposed, Continental engine, slopes down sharply and tapers inwardly slightly at the sides.

Cockpit is open and placed at high point of the fuselage, above the rear of the wing.

▶ **View**—This general arrangement, coupled with the low placement of the wing, substantially should provide these characteristics:

- **An excellent view** forward and down for low altitude dusting and spraying, together with better ability to judge clearance of houses, trees, wires, etc.
- **Clear view in direction** of turning when making a turn at low altitude, at the end of the swath.
- **Good visibility** to see the swath that has been laid.
- **Clear view ahead** over the nose for taxiing in small, unprepared fields.

▶ **Safety**—Though optimum location of pilot, from a safety point-of-view would be in the tail end of the plane, the compromise placement in this design still places him behind all loads.

He will have a strong seat, belt and shoulder harness, capable of taking a 40G load.

Shoulder harness will have an inertia reel normally allowing pilot freedom of action, locking with crash deceleration.

Large rudder pedals with toe brakes will protect his feet.

The headrest will be sufficiently strong to serve as a turnover structure, with bracing running halfway back towards the fin.

The tubular steel framing running over the open cockpit, from its front to the top of the overturn structure, will act as a wire deflector. A cable running from the tube end to the top of the fin will carry wires over the tail or sever them.

And leading edges of the spring steel landing gear are sharpened for wire cutting.

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▶ **Distribution Details**—Initially, the experimental plane will have a hopper in the fuselage, for dusts, fertilizers and seeds. Volume will be about 27 cu. ft., and location will be on the craft's center of gravity, directly in front of cockpit.

It is planned to follow best present practice by releasing the material through an adjustable sliding gate and distributor. After initial flight studies, further development of distribution systems is contemplated.

There is sufficient room in each outer wing panel to accommodate a hopper, both installations also totaling about 27 cu. ft. Placement of hoppers in the wing probably would give substantial improvement in uniformity of distribution, particularly if satisfactory metering devices are developed.

Thought has also been given to more complex distributing systems, such as mixing the dust with air, blowing it out tubes placed along the span, as in spray systems.

▶ **Spraying**—First spray scheme will follow conventional practice.

Two synthetic rubber-lined tanks in the center panel will have a total capacity of 150 gal. An engine-driven pump will deliver the liquid through manifolds to outlet nozzles, and incorporate means for loading the spray tanks from containers at ground level.

A valve regulating fluid pressure will meter the spray.

In the first installation, the spray boom will be located within the wing contour between trailing edge and flap. Here, it will be accessible from the outside, yet have no appreciable effect on drag.

▶ **Performance**—Striking a favorable compromise on operators' suggestions for dust or spray loads varying from 400 to 2000 lb. (most ranging from 600-1200 lb.), the experimental craft will carry a normal maximum 800 lb. of dust or spray, with provisions for overloading to 1200 lb. under unusually favorable takeoff and operating conditions.

It has been designed to take off from a soft field with a full load and climb to a height of 50 ft. within 1320 ft. But latest estimates indicate it should do slightly better than this.

To meet this takeoff requirement, the simple, fixed, spring-steel landing gear will have oversize balloon tires.

Operating speed for dusting or spraying will range from 60 to 90 mph. Cruising speed for cross-country flight will be 90 to 100 mph. The fuel capacity of 48 gal. should give 5½ hours cruising at 150 bhp.

Position lights and illuminated instruments will be incorporated for flying in the dark. A turn-and-bank indicator will serve when ground reference is lost.

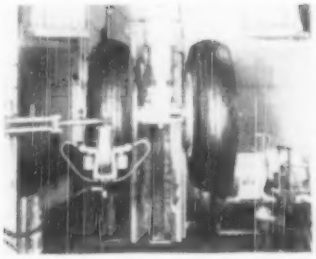
For most conditions of operation a single flap setting probably will be useable for the entire cycle of takeoff, spraying or dusting, and landing.

Here are some operational features the designers are aiming for:

- **High maneuverability** at low speeds.
- **Ability to normal** maneuvers to pull up sharply and make turns at the end of a run without stalling, insofar as using lateral control. Since the problem of attaining sufficiently responsive lateral control at low speeds and very high lift coefficients is difficult, special means are being considered, including rudder-aileron interconnection and addition of cut lip ailerons or spoilers.

An attempt will be made to obtain lateral control at all speeds and angles of attack that can be maintained, even with control stick full back. Another design criterion is that the plane be spin-proof. A full span leading edge slot will be used if found necessary.

Unit propeller to be used will be a one-piece aluminum alloy unit, but a variable pitch prop will be used in later trials.



Drop Test Device

Bendix engineers have developed a precutation device, used in drop testing of landing gear, that is much smaller and lighter than equipment formerly used.

The new wheel spinner (left foreground) also is more flexible in operation than the bulky electric motor set up (right background) it replaces, and is described as being remarkably free of vibration. While it is a lightweight, the novel rotation device can spin the heaviest aircraft wheels up to 150 mph ground speed.

The unit gets its "zip" from two hydraulic motors, delivering about 12 hp. on a common shaft to turn the drive wheel which contacts the landing gear tire. A steel guard covers the outer half of the drive wheel. The entire assembly is mounted on an arm which swings the spinner away from the wheel when not in use.

On dual wheel installations, power is applied to one wheel (left) and electronic tachometer readings are taken off the other (right).

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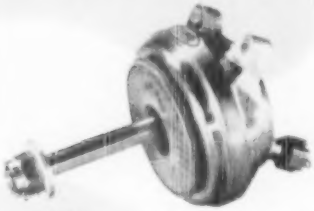
DYNAFOCALS ADD 20 POUNDS PAYLOAD



to MARTIN 4-0-4

THROUGH skillful engineering and design, LORD has developed a Dynafocal Engine Suspension which saves 20 pounds of weight on each Martin 4-0-4. This weight saving adds an equal amount of revenue-producing load capacity, which means more profitable operation for T.W.A. and Eastern Airlines when their new 4-0-4's are placed in service.

Development of the MR-36J Lightweight Dynafocal is another example of how LORD's advanced engineering pays a profit to the user. LORD specializes in the control of vibration and supplying of precision-made Bonded-Rubber Parts for product improvement. Let LORD engineers assist you to obtain efficient and economical answers to your vibration problems. Write to attention of Product and Sales Engineering Department.

LORD MANUFACTURING COMPANY
ERIE, PENNSYLVANIA

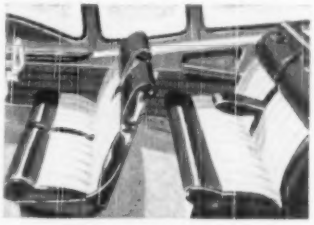
Canadian Representative
Railway & Power Engineering Corporation, Ltd.

LORD

Vibration-Control Mountings . . . Bonded-Rubber Parts

NOW...*The Better-than-Ever* SUPER 260 NAVION *for* '51

Want the performance thrill of your life? Fly the new, better-than-ever Super 260 *Navion* for 1951! Feel the *surging power* of the 260-hp Lycoming engine . . . relax while the *exclusive* inter-connected control system practically flies the 170-mph *Navion* for you. Yes, flying's more fun in the new Super 260 *Navion*. It outcruises, *outclimbs*, yet lands shorter than other planes in its class. And, for '51—look at these brand new features:



• NEW... *More Beautiful Interior Styling*

Luxurious interiors styled by Charles of California. Beautiful harmonious colors and fabrics with generous leather trim. Upholstery is extra-thick foam rubber. And the new "reverse flow" ventilating system brings plenty of bracing fresh air into the comfortable, roomy cabin.

• NEW... *Exterior Baggage Door*

The new *Navion Luggage Master* makes baggage a cinch to load and unload. No need to climb in and out of plane while loading . . . do it all from the outside. Luggage Master is equipped with a sturdy lock for complete protection. Folding rear seat affords easy access to baggage in flight.

• NEW... All metal selective pitch Hartzell propeller . . . push-button starter on the dash board . . . beautiful, new two-tone exterior enamel finishes . . . sun-visors and curtains for pilot and passengers.

Ryan Navion

NO OTHER PLANE COMBINES SO MANY FEATURES SO WELL

Rely on Ryan RYAN AERONAUTICAL COMPANY, 410 LINDBERGH FIELD, SAN DIEGO, CALIFORNIA

Ingenuity Aids Field Maintenance

(McGraw-Hill World News)

An Airbase in Japan—Air Force maintenance men have been having a strenuous time removing stress plates from damaged aircraft. Normally it takes 18 man-hours to drop a panel from the wing of an F-80 Shooting Star. With the screw remover, invented by M/Sgt. A. K. Krause of the Far East Air Materiel Command, the job now takes only 1½ man-hours.

Pictures show the device and Sergeant Krause demonstrating it on the wing of an F-80. It is used on all aircraft at this base. Maintenance chiefs line up to borrow it.

The screw remover has a slotted foot. This is slipped under a loosened screw head and becomes the anchor for the screw driver. The screw driver slides along slot in the device's arm. The screw head is changeable so that all types of screws can be removed.

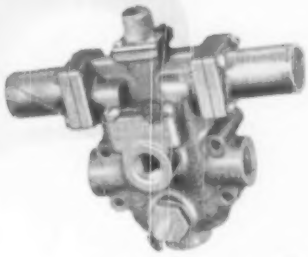
Radio-Telephone

A new radio-telephone set tailored to fit the specific needs and budget of the private airport operator is being marketed by Schuttig and Co., Inc., Ninth and Kearny Sts., N.E., Washington 17, D.C.

This set, called Tel-Air, operates on a frequency of 122.8mc. It has a transmitter power output of 10w. and a receiver sensitivity of 1mv. Among advantages listed by the maker for the unit are ability to operate continuously, its simplicity and optional remote control.

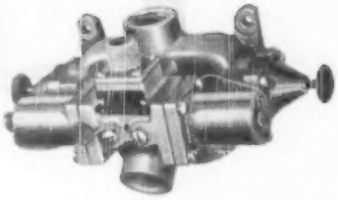
New **ADEL** *Lightweight*

3000 PSI SOLENOID, PILOT-OPERATED 4-WAY SELECTOR VALVES



New ADEL poppet type selector valve No. 21700. Internal leakage in neutral position 1 drop per minute maximum at 3000 psi. When in neutral, cylinder lines vented to return. Can be used as a pair of separately controllable 3-way valves. ⅛ and ½ inch line sizes.

Weight 2.0 lbs.



New ADEL slide type selector valve No. 25586. Internal leakage in neutral position 1 cc per minute at 3000 psi. When in neutral, cylinder lines can be blocked or vented to return. Variations available with centering springs or detents. ¼, ⅜ and ½ inch line sizes.

CHARACTERISTICS OF BOTH POPPET AND SLIDE TYPE VALVES:

- ★ No moving seals.
- ★ Integral filter for protection of pilot valve against effect of dirty oil, foreign particles, etc.
- ★ Continuous duty solenoids, either 1 or 2.
- ★ 4500 psi. proof pressure on all ports.
- ★ Pressure drop 50 psi. at 6 gpm.; 100 psi. at 9 gpm.
- ★ Produced for 17-30 volts dc, 10 watts minimum, available for other dc voltages.
- ★ Available with or without manual control.

New designs are more compact, have low weight, longer service life, less maintenance, easy installation characteristics plus increased operating efficiency. ADEL'S extensive engineering and manufacturing experience in Aviation Hydraulic Equipment insures uniform excellence of products.

FOR DEPENDABLE PERFORMANCE . . . *Specify* ADEL . . . For complete engineering specifications and counsel, address ADEL PRECISION PRODUCTS CORP., 10777 Van Owen Street, Burbank, California.

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COUPLINGS

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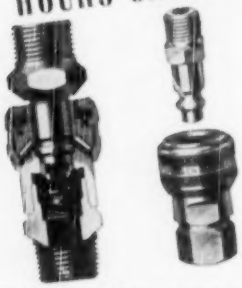
HOURS GAINED



Hansen Push-Tite Quick-Connective Coupling

CONNECTION
takes only a Second

● You save time with Hansen couplings every time you connect or disconnect a fluid line carrying gas, liquid or grease, because Hansen couplings connect or disconnect immediately—with instant automatic flow or shut-off.

To connect, merely push plug into socket—flow starts instantly. To disconnect, pull back sleeve on socket—coupling disconnects and automatically shuts off flow.

From a wide range of available sizes and types, you can select a Hansen coupling—one-way shut-off, two-way shut-off, or straight through type—each engineered for your specific application.

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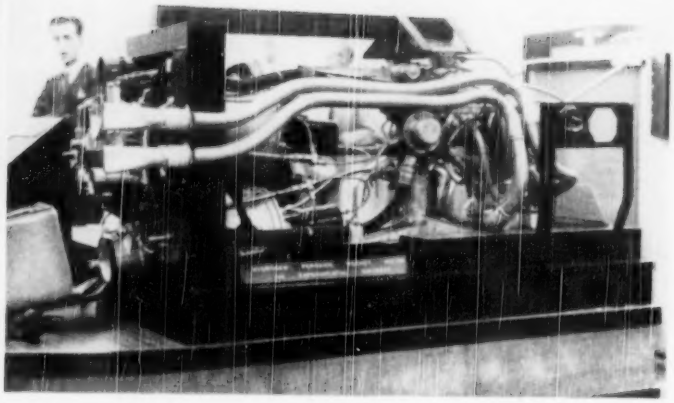


Britain Unveils Rocket Motor

New power unit built by Fairey, already flown, has movable cylinders for pitch and yaw control.

London—Britain's latest rocket engine, using hydrogen peroxide as an oxidizer for an unstated fuel, was exhibited for the first time at the Society of British Aircraft Constructors' Display at Farnborough.

The new rocket motor, designated the Beta, was built for the Ministry of Supply by Fairey Aviation Ltd. Layouts and specifications for the design were prepared by the Royal Aircraft Establishment at Farnborough.

The engine has already flown in an experimental aircraft.

▶ **New Approach**—It represents a departure from the earlier British work with so-called "cold" rockets, such as de Havilland's Spritc. (In a cold rocket, hydrogen peroxide is the only fuel, and it is decomposed into superheated steam in a catalyst, such as calcium or sodium permanganate.) In the Beta rocket, hydrogen peroxide is the oxidizer for a fuel which could logically be any one of a number of hydrocarbons.

Beta has two cylinders, arranged one above the other. Both are gimbal-mounted.

Thus the upper cylinder can be moved to steer the aircraft in pitch, and the lower cylinder handles yaw control.

Another interesting feature is the use of Inconel meshes, rather than the usual compression drum, to take the thrust at the rocket motors.

▶ **Peroxide Coolant**—In the engine, the hydrogen peroxide serves as a cooling agent. It is circulated through a jacket surrounding the motor combustion chambers and nozzles.

It also serves another purpose: a portion of the peroxide flow is directed to a steam generator to supply power to drive a turbine. A fuel pump and an oxidizer pump are in turn driven by the turbine's extended center shaft. (This system was also used to drive the German V-2 fuel and oxidizer pumps.)

Starting the engine is done by applying an external source of pressure—which could be compressed air—to force some of the peroxide into the steam generator.

After turbine and pumps have been driven up to speed, the main propellant valves are opened. A small amount of peroxide is continually supplied to the steam generator to keep the process going.

▶ **Photo Detail**—There are some further interesting points best described by the photograph reproduced here.

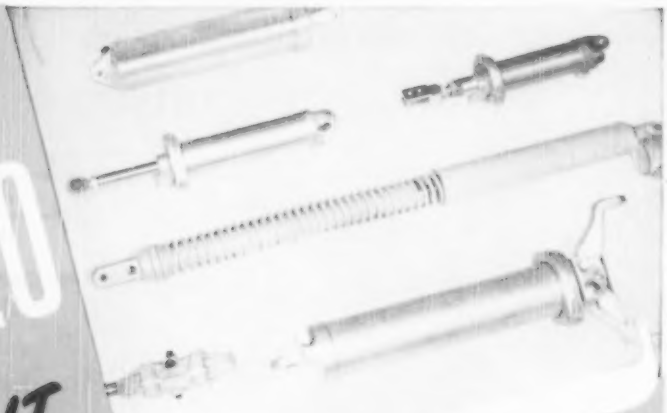
The two motor cylinders are at the left, but the upper one is almost obscured by the frame and miscellaneous lines.

The two lines which run the length of the motor frame and discharge toward the left through flattened pipe sections function as the turbine exhaust lines.

The round, multi-ported valve sought at the center is the main peroxide distributing valve. Starting valves are not visible on this side of the motor, but they are solenoid-operated, and based on German designs. The valves are normally open. That way, they conserve the aircraft electrical power, since continuous application of current is not needed to hold them open.

Main fuel and oxidizer takes go to a valve on the right side, where the octagonal holes are to be seen in the mounting plate mounted above the main frame.

LET EX-CELL-O MAKE IT



Precision parts and sub-assemblies, made to customers' specifications, are an Ex-Cell-O specialty. Typical of Ex-Cell-O's products for the aircraft industry are the precision parts (at left) and hydraulic assemblies (above) shown on this page. Ex-Cell-O has complete engineering, machining, heat-treating, grinding, sub-assembling, and inspection facilities—all under one competent, experienced management. Ex-Cell-O makes precision parts to your specifications, in small or large volume, and delivers them in accordance with your schedule. To see how this service can benefit you, write Ex-Cell-O in Detroit today.

EX-CELL-O CORPORATION DETROIT 32

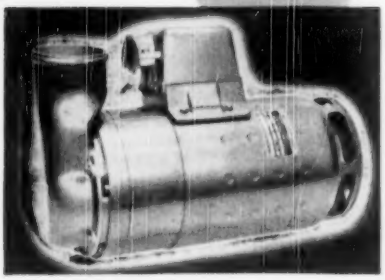
Special Multiple Way-Type Precision Boring Machines • Special Multiple Precision Drilling Machines • Precision Boring, Turning, and Facing Machines and Fixtures • Precision Cylinder Boring Machines • Precision Thread Grinding Machines • Precision Lapping Machines • Precision Broach Sharpening Machines • Other Special Purpose Machines • Tool Grinders • Continental Cutting Tools • Broaches and Broach Fixtures • Counterbore Sets • Grinding Spindles • Hydraulic Power Units • Drill Jig Bushings • R. R. Pins and Bushings • Fuel Injection Equipment • Dairy Equipment • Aircraft and Miscellaneous Production Parts

49-6

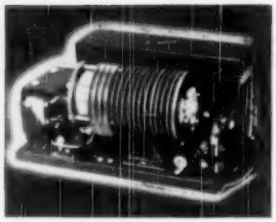
YOU CAN BE SURE.. IF IT'S Westinghouse

(A) Feeder and Generator Ground Fault Relay

(B) Dual Contactors with Reverse Current Back-up Relay and Feeder Ground Fault Protection



(C) Buttonhole Quick Disconnect Generator



(D) Centralized Plug-in Control Panel

DESIGN FEATURES

1. System functions co-ordinated.
2. Accurate control selectivity eliminates hazards of over-excited generators in overvoltage and overload conditions.
3. Ground fault protection with current balance or shunts.
4. Concentrated bus.
5. Back-up bus protection.
6. Centralized control panel. Shock-mounted.
7. Arc interruption by dual contactor.
8. Electrical and manual trip-free operation.
9. Field relay automatically trips with reversed generator polarity.
10. Lightest weight for comparable performance.
11. Generator overtemperature indication. (Optional)
12. Dead bus system operation.

For complete specification data, contact the nearest Westinghouse Sales Office.

AIRCRAFT D-C ELECTRICAL SYSTEMS

"packaged" for four-way savings

Westinghouse placed in service the first "packaged" and protected co-ordinated Electrical Power Systems for aircraft early in 1946. Its many new and convenient features have now been thoroughly service-proved in hundreds of commercial and military installations. Continuously developed improvements provide the system of the future.

The D-C system diagrammed here is typical of those operating on aircraft such as the Martin 202, the Lockheed P2V, the North American AJ1, the Northrop C-125, the Aero Sud-Est SE-2010 and the Brequet 763. 145000

The economic advantages of these "Packaged" Power Systems are fourfold . . .

1. Quick and Easy Maintenance

Centralized plug-in type control panel permits all maintenance of controls to be performed at shop bench. Engine run-up operation is no longer necessary for accurate paralleling of generators. Generators equipped with the Westinghouse buttonhole flange may be removed and replaced in 1/8th the time required with the conventional mounting flange.

2. Long-Life Parts

"Packaged" components have been carefully co-ordinated and contacts are of liberal size to give extra service life. Records show that the new voltage regulator has greatly extended life over other types and replacement parts cost less. The generator overhaul time can be co-ordinated with the engine overhaul time.

3. System-Wide Power Protection

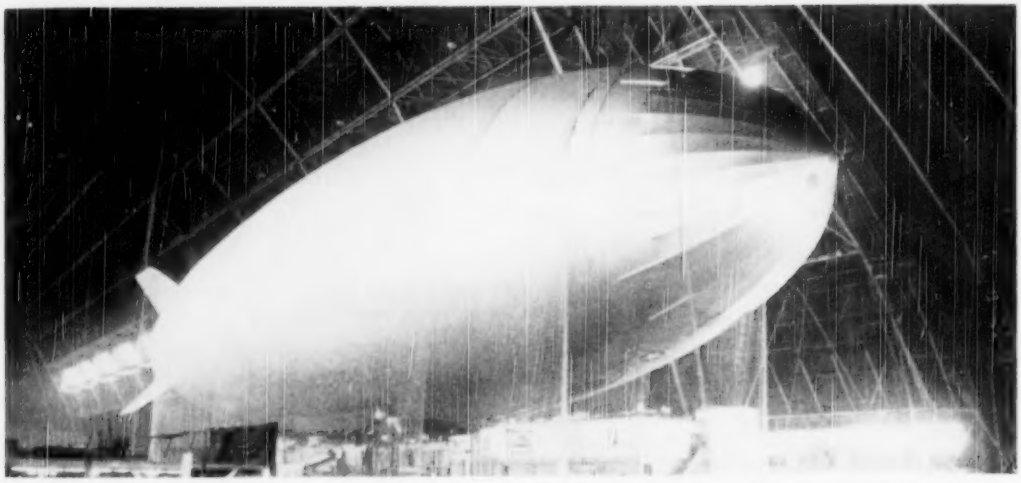
Instantaneous fault isolation results in far less risk of damage to generator, control devices, cables and structures during the existence of the fault.

4. Unit Responsibility

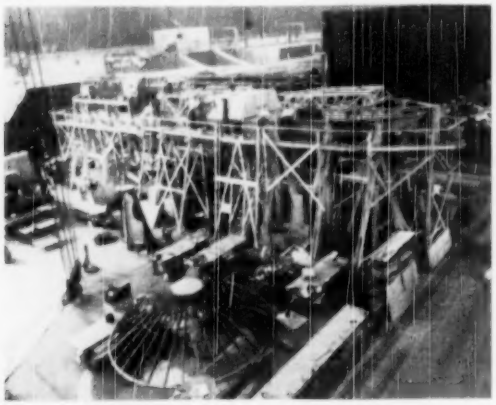
Not an assembly of individual parts but an integrated "package" designed and produced by one manufacturer with undivided responsibility for the service and performance of every component.

Westinghouse

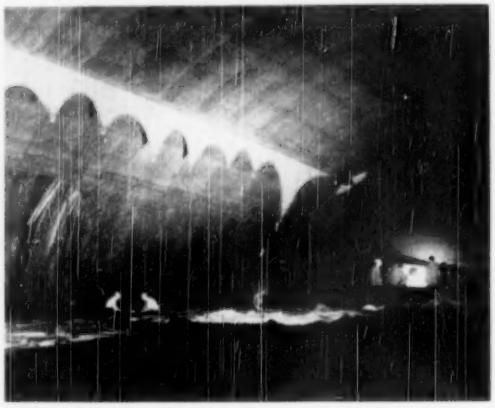
Leader in Aviation Equipment



GOODYEAR ZPN AIRSHIP at Akron, Ohio. Huge, 324-ft.-long helium filled envelope is restrained by netting, awaiting mounting of . . .



CONTROL CAR which is being constructed separately in dock.



FORTISAN RAYON gas bag interior undergoes minute inspection.

Biggest Navy Blimp Nearing Completion

STREAMLINED NACELLE mounts big C-W reversible pitch propeller.

The U.S. Navy's most ambitious non-rigid airship project is well under way at Goodyear Aircraft Corp., Akron, Ohio.

The new prototype ZPN, designed to track down subs, and capable of very long duration, will have a capacity of 875,000 cu. ft. of helium gas, compared with the 725,000-cu. ft. capacity of the M-type ship, formerly our largest.

The ZPN is being fitted with two seven-cylinder Curtiss-Wright Cyclone 7 engines of 800 hp. each, turning 18-ft. three-blade Curtiss Electric reversible pitch props. The engines are mounted within the cabin and geared shafting is carried out within outriggers to streamlined nacelles on either side of the cabin.

If necessary either engine can drive both props. Top speed is planned at 75 knots.

Duration is classified. But the smaller M-type ship holds the world's sustained flight record without refueling (over a week). Special equipment makes it possible to refuel the airship while hovering above a surface vessel, or to rehydrate by picking up ocean water.

The envelope is made of Neoprene-coated Fortisan rayon. Control car is of aluminum alloy sheet sandwiching a balsa core. The control car will be a two-deck affair, with operational stations on the lower portion and crew's quarters on the upper deck. Landing gear is retractable tricycle, with nose wheel folding up into the forward end of the cabin, and the other wheels going up into the outboard nacelles.

NAVY

adds new logistic support!

Douglas DC-6 enters military service

To meet the need for increasing air lift, the U. S. Navy has ordered a fleet of R6D-1 aircraft.

This is the Navy's designation for the DC-6A *Liftmaster* which was developed from the world-famous Douglas DC-6 passenger transport.

On long missions this 320 mph airplane has double the cargo capacity of the R5D (C-54), yet it is one-third less costly to operate, takes one-fourth less manpower.

In the R6D-1, Douglas provides a ready answer to an urgent military need for a high-speed, long-range, *dependable* air transport.

DOUGLAS AIRCRAFT COMPANY, INC., SANTA MONICA, CALIFORNIA

DEPEND ON DOUGLAS

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ENGINEERED ENGINE INDICATORS

ECLIPSE-PIONEER'S

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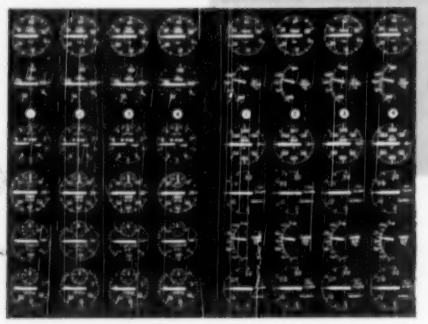
CLAMP-ON INDICATORS FOR ENGINE FUNCTIONS

NOW AVAILABLE FOR ALL MILITARY AND COMMERCIAL PLANES



Here again is the type of pace-setting development work that has consistently highlighted Eclipse-Pioneer's leadership in this field. Developed in cooperation with the Equipment Laboratory at Wright Field, these new "clamp-on" instruments are built around the famous Eclipse-Pioneer High Precision Autosyn* which inherently assures an exceptionally high degree of accuracy. A further advantage becomes apparent when these instruments are grouped so that all pointers are parallel during normal operation. Experiments with this type of arrangement revealed that entire panels could be read accurately *in a fraction of the time normally required* . . . any abnormal condition becomes obvious immediately when one of the pointers moves out of line. However, for precise readability of critical functions, a servoed indicator with secondary pointer is available in the same small diameter case. Clamp-on instruments are extremely lightweight and offer tremendous savings in installation and maintenance time. A simple bezel attachment will adapt these new Eclipse-Pioneer High Precision engine instruments to the standard AN openings in your present instrument panels. So, write today, get all of the details on this latest product of Eclipse-Pioneer's experience and ingenuity.

*Registered trademark of the Bendix Aviation Corporation.

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LOOK FOR THE PIONEER MARK OF QUALITY

Engine Production of French Companies

This tabulation digests the status of France's major engine projects. It supplements airframe data previously published in AVIATION WEEK (Sept. 19, Aug. 28) to give a broad picture of France's aero industry.

Engine	First Trial	Type	Status
Arsenal de l'Aeronautique (Nationalized)			
12 H	12-46	12-cyl. V-type, 21,000 hp.	80 prototypes; 60 in production
24 H	9-15-46	24-cyl. H-type, 4000 hp.	12 prototypes, tests stopped
Fuhrer	11-47	Modified V-1, thrust 330 lb.	12 prototypes; 29 in service
S.N.E.C.M.A. (Nationalized)			
4 J	6-46	4-cyl. Inline, 75 hp.	3 prototypes, series of 12, started
4 K	6-46	4-cyl. Inline, 100 hp.	3 prototypes, rejected
4 L	11-46	4-cyl. Inline, 147 hp.	6 prototypes; 750 built
4 L 2	under test	4-cyl. Inline, 170 hp.	3 prototypes (modification of 4 L)
4 P	prewar research	4-cyl. Inline, 150 hp.	Production plan for 100
6 Q	prewar research	6-cyl. Inline, 280 hp.	Small series planned
12 S C 2	Argus license	12-cyl. Inline, 580 hp.	1500 in service; 650 in production
14 Mars	prewar research	14-cyl. Radial, 700 hp.	Being modified
14 X Super Mars	under test	14-cyl. Radial, 825 hp.	1 prototype; eventual series
14 N	prewar research	14-cyl. Radial, 1120 hp.	Modification and improvement to add 500 hp.
14 R 200	prewar research	14-cyl. Radial, 1600 hp.	650 under production
14 R 200	2-48	14-cyl. Radial, 1850 hp. (injection type)	Series under production; improvement of 14 R 200
14 U	6-48	14-cyl. Radial, 2350 hp.	3 prototypes reported
8 V 4 B 101	11-46	Centrifugal turbojet, 4840 lb. thrust	6 prototypes; initial series; 3 of another series probable
7 U 100	7-50	Turboprop (9 stages) 1450 hp.	2 prototypes; series probable
Hispano Suiza			
12 Y	9-47	12-cyl. V-type, 1800 hp.	Under certification
Nene	7-47	Centrifugal turbojet, 5,115 lb. thrust	Under license; production 30 per month
Potez			
4 D 02	Accepted '46	4-cyl. Inline, 160 hp.	2 prototypes on test flight
4 D 32	2-48	4-cyl. Inline, 180 hp.	2 prototypes on test flight
4 D 37	1949	4-cyl. Inline, 220 hp.	2 prototypes; series planned
6 D 06	1950	6-cyl. Inline, 240 hp.	2 prototypes; series planned
9 R	prewar research	9-cyl. Radial, 250 hp.	10 built in 1938 for helicopters
8 D 00	Accepted '46	8-cyl. V-type, 420 hp.	10 prototypes
8 D 30/32	1948	8-cyl. V-type, 450 hp.	6 prototypes; development stopped
12 D 00	prewar research	12-cyl. Inline, 275 hp.	3 built
8 D 40	1950	8-cyl. V-type, 600 hp.	2 prototypes under tests
12 D 50	1949	12-cyl. Inline, 475 hp.	1 prototype; tests suspended
Mathis			
4 G 20	12-47	4-cyl. Inverted inline 100 hp.	2 prototypes; 10 built
7 G 20	5-48	7-cyl. Radial, 275 hp.	3 prototypes; 10 built
8 G 20	6-46	8-cyl. Inverted V-type, 200 hp.	3 prototypes; 240 built
8 GB 32	10-48	8-cyl. Inverted V-type, 225 hp.	2 prototypes; series of 5
4 G 00	3-47	Tractor, 70 hp.	3 prototypes; series of 12
Salmson			
9 AD	10-45	9-cyl. Radial, 230 hp.	250 built
9 AC	11-47	9-cyl. Radial, 135 hp.	40 built
5 AQ	7-50	7-cyl. Radial, 140 hp.	1 prototype; series probable
Rateau			
TP 6 G	2-49	Experimental axial turbojet	3 prototypes for government
GTP 60 Rateau		Axial turbojet	1 prototype for private research (being assembled)
Lutetia			
4 C 01	9-49	4-cyl. V-type, 40 hp.	1 prototype; series planned
4 A 01		4-cyl. Radial, 70 hp.	1 prototype (being assembled)
Leduc			
Leduc	prewar research	Ramjet	3 prototypes (all underwent tests)
Minie			
4 DA 29		Flatiron, 75 hp.	1 under production

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Precision has been our business for 48 years—we consider this backlog of experience in designing, engineering and manufacturing one of our invaluable assets, so essential to any organization doing this kind of work. Invaluable, too, are the many veteran and skilled IGW craftsmen who have grown up in the business and to whom precision workmanship is second nature.

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AVIONICS

Navigation Experts Trade Ideas

Application of electronics to related problems of air, land and sea travel stressed at joint meeting.

The growing complexity of traffic problems and the need for integrating navigational procedures for a unified approach were the main themes of the recent symposium in New York that brought together eminent authorities in the important field of transportation regulation.

The three-day joint meeting, sponsored by the Institute of Navigation, Radio Technical Commission for Aeronautics, and the Radio Technical Commission for Marine Services, offered opportunity for exchanging experience data and plans for promotion of the navigation art, and clarifying the philosophies and trends in the whole field of navigation.

▶ **Density Dangers**—The growing specter of denser traffic will require a clear appreciation of the application of electronics to the related problems of air, land and marine navigation. Certain correlations are already evident, and there is reason to believe there are many more than can be adapted advantageously by the different forms of transportation.

Symposium panels were devoted to these aspects:

- **Evaluation of electronic aids** from the "customer" point-of-view, covering safety, economies and special applications, with the aim of stressing requirements not yet satisfied.
- **Parameters of electronic aids**—what information must be supplied, how often, how accurately, and frequencies now used and available.
- **Types of electronic** navigation systems, their capabilities and limitations, with analysis of coverage, accuracy, instrumentation, costs, spectrum utilization, and application to the different modes of transportation.
- **Coordination of air,** land and marine traffic as individual problems, with the object that principles common to all will become apparent. Also, how principles applied in one service may suggest solutions to similar problems in the other two services.
- **Application of navigation** techniques to problems of arrival.
- **Analysis of where we are** in the field of electronic navigation, coupled with a critical look at the job to be done and how to do it, with emphasis on the need for the three transportation modes to work together to avoid duplication of effort.

▶ **Control Considerations**—Douglas H. Ewing, Air Navigation Development Board's director of development spoke on air traffic coordination. Observations made:

- Peak demands now run from 40 to 50 landings per hour.
- Position determination alone for traffic control computation is not sufficient; velocity information also must be provided.
- Thirty seconds is the minimum safe separation possible between successive aircraft in a traffic pattern, because of prop wash.
- Approach pattern speeds, even of aircraft of the same type, can vary as much as 20 percent. This speed error adds 45 sec. to the separation time (total of 75 sec.). This speed error possibly could be cut down to 10 percent if ground control measures the speed and tells the pilot what speed is desired, but "it is unsafe to fiddle with speed" because only the pilot knows the critical speed of his plane for its particular flight condition.
- It is not good for safety's sake for the ground to tell the pilot he must maintain a certain speed.

Amplifying his discussion, later, Ewing said:

"The rate at which you can accept aircraft on a given runway is not something you can pick out of the air, but is dependent upon the type of aircraft going to land, configuration of taxiways with respect to the live runway, variations in speed of aircraft, accuracy of the traffic control system, and accuracy with which pilots or automatic pilots can follow instruments.

"ANDB is trying to understand first what kind of traffic control is needed before trying to design a traffic control system."

▶ **Long-Baseline System**—Winslow Palmer, Sperry Gyroscope Co. research engineer, discussed hyperbolic systems. Gist of his paper was that if we could have a long-range navigation system with a 3000-mile baseline, then with 20 stations we would be able to cover the entire world. A system which could do this is a hyperbolic system known as Radux.

Accuracy with the system would be

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SERVICING BUSINESS PLANES is an important part of Dixie's operation. Here Manager Dal Miller, (right) discusses maintenance with A. W. Frederick, Marchant Calculator Distributor, Memphis.

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ses than that with a short-base system but considering the long distances involved when using a long-baseline system, an error of 10 miles (which probably would be involved) would not be serious.

To demand a more accurate system would mean ruling out worldwide coverage (getting a fix in any part of the world). Higher accuracy would require a shorter baseline and this would not be feasible where islands and other land locations are separated by great distances.

Rear Adm. A. M. Pride, chief of Navy's BuAer, Capt. J. W. Davison, Navy representative to RTCM, and Cmdr. Thomas D. Davies (who was skipper of the Truculent Turtle), all stressed the need for keeping navigation simple.

Cmdr. Davies received the Thomas B. Thurlow Award for 1949, at the meeting, for his part in the research and development of the Pfund sky compass for navigation in the polar regions during the long twilight periods.

"Brain's" Double Job

A new "electronic brain" is playing a dual role at Consolidated Vultee Aircraft Corp.'s Ft. Worth division.

Capable of performing 6000 useable equations in an hour, it not only drastically cuts man-hours required for the complicated calculations in Convair's aerodynamics section, but does a major job in reducing the work load in the Ft. Worth plant's accounting department.

Known as a card programmed electronic calculator, the brain—made by International Business Machines Corp.—now determines quickly the paycheck figure for employes.

Former procedure required tedious manual calculation of base pay, overtime, and numerous deductions. Now a stack of cards is fed into the calculator and it comes up with the net pay check figure in a matter of seconds. The entire payroll operation takes less than half the time formerly required.

This application of the brain is believed to be first such use in the country.

Cut Hits ASD Plans

A cut in Civil Aeronautics Administration's proposed budget for 1952 has forced it to shelve plans to install five sets of airport surface detection equipment in fiscal 1952.

Commerce Department reported this to committees working with Air Navigation Development Board after AVIATION WEEK had gone to press with its September 18 article based on CAA's 1952 avionics budget proposals.

Some other items have also been slashed. But equipment most essential to all-weather operation has not felt the budget axe, a government spokesman says.

Except for postponement of the air surface detection equipment, the CAA 1952 avionics program tentatively prepared for submission to the Budget Bureau is not now substantially changed from that reported in AVIATION WEEK.

Approach Light Tests

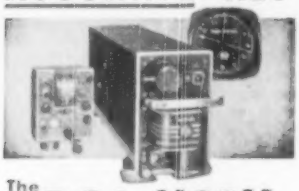
First tests of a new center-line, high intensity approach light system at Newark, N. J., Airport are slated to take place this fall.

Strongly endorsed by the Air Line Pilots Assn. (AVIATION WEEK July 24), the system features ultra-bright Sylvania condenser discharge flashers. CAA will mount the flasher units separately in front of standard slope-line bar fixtures.

The center-line system will extend about 5000 ft. out from the approach end of the runway. Flashers and white bar lights will be placed every 100 ft. outward from a red crossbar to be installed 200 ft. from the approach end of the runway. A white crossbar will be 1000 ft. out. Sealed beam 250-watt lights with green filters will be placed 12 ft. apart to outline the first 200 ft. of the runway.

Your answer to

ACCURATE ADF



The **RCA "21"**

- Weighs only 50 pounds—installed
- Completely self contained
- Only half the size of similar airline equipment
- Makes dual ADF practical
- Signal sensitivity, better than 10 μv/meter
- Frequency range 150-1750 kc
- Signal-to-noise ratio, 2-to-1 at less than 3 μv/meter
- Power drain, only 5.5 amperes at 28 volts, or 7 amperes at 14 volts
- Meets new RTCA and CAATC requirements

For information, see your RCA Aviation Dealer. Or write

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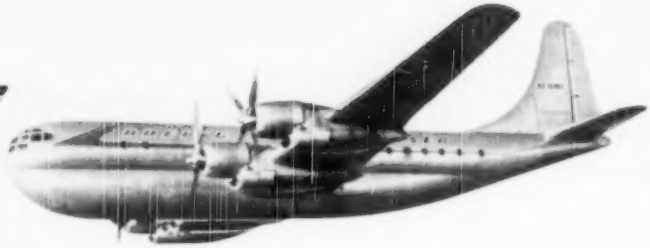
They all approve the Boeing Stratocruiser!



"We can fly operations with the Stratocruiser—where it's smoother, faster, but the passengers are 'dismantled.' Why—we can hold sea level cabin altitude up to 25,000 feet and even at 25,000 the cabin is only at 5,000 feet."—M. Kenneth Bateman, *staff engineer, Pan American World Airways*

"Most popular feature? I vote for the air conditioning system. Imagine! The air changed every 40 seconds. Filtered to take out odors—even the color of cigarette smoke—no drafts and even, steady temperatures."—Nora J. Eberg, *assistant supervisor of stewardesses and parlors, American Overseas Airlines*

"The control cabin arrangement is the best ever. Controls and instruments are arranged for efficient use and there is plenty of room in the 'bridge' for pilot, co-pilot, navigator and engineer to perform their duties. This is valued on air time."—Captain H. P. Lyons, *pilot United Air Lines*

"The comfort of the seats—full lap illumination for reading; the quietness; freedom from vibration—seems to me every trip so the passenger memorizes a new feature that particularly impressed him."—Jack Nettleingham, *staff assistant, British Overseas Airways Corporation*

"Passengers tell me they like its roominess—wide aisles, two decks, big lounge rooms. They can move around—don't feel cooped up. And the Stratocruiser handles beautifully—stable, responsive and dependable."—Norman Hoover, *a pilot, Northwest Airlines*

Airline personnel are good judges of airplanes. And on the five airlines that fly the twin-deck Stratocruiser, the great new Boeings win their enthusiastic approval. Where there is a choice, they say, more and more people want to fly the Stratocruiser ahead of any other plane.

BOEING
STRATOCRUISER

Boeing has built fleets of Stratocruisers for these forward-looking airlines: BRITISH OVERSEAS AIRWAYS CORPORATION · PAN AMERICAN WORLD AIRWAYS · NORTHWEST AIRLINES · AMERICAN OVERSEAS AIRLINES · UNITED AIR LINES

For the Air Force, the B-50 Superfortress, B-47 Stratojet and C-97 Stratofreighter. For the Army, the L-15 Scout liaison plane.

LETTERS

Lightplane Debate

In answer to E. W. Lawler's letter about lightplanes in the July 24 issue, it is my opinion that Mr. Lawler is disillusioned.

He mentions the 1930 type airplanes offered for sale as 1950 models. He may be right but.

In 1929 when I was not the right age, my father bought a Pietzer Arrow sedan. I drove it 50 mph. in second gear and 57 mph. in high, over a measured course against a stop watch. I seem to remember a tech pilot by catching hell from his pops in 1917 or 1919 for drawing an four-cylinder Rolls Royce roadster 114 mph.

Recently an ad appeared which lauded a stock 1950 model motorcar for clocking 97 mph. in a speed run . . . not much of an advance over 1929.

Come to think of it—where is the automotive advancement? Well, I believe it is in such things as smaller, close tolerance engines developing greater horsepower per pound, better noise levels, greater leg room, better visibility and ventilation, radios, heaters, ash trays, plastic decorations and—even Kleenex dispensers. But certainly airplanes as well as automobiles display all of these advancements.

He lies me on the question of price but that hinges on utility. There is more to that in an airplane than most people know how to use—or even to want to learn to use. That's a complete subject in itself.

Since Mr. Lawler and I can't "see" we scot. But let's keep our comparisons in line. We are going to take our family on a trip and suppose we use a Stinson 153 as he mentions. This airplane affords passes than average dollar to mile ratio, but if we fill the seats, consider the time saved, greater mile cost and utility, it is cheaper than other paid transportation such as trains, buses or airlines, which offer no utility.

As for using an airplane in business, it depends of course, on whether you need to work at flight-office or traveling client. Challenge anyone who travels very much—especially salesmen—in a debate on whether he can write more business by using an airplane, or where he can have more time at home—whichever he prefers.

Rex B. Grones, Jr.
422 North Griffith Park Dr.
Burbank, Calif.

After reading E. W. Lawler's letter in AVIATION WEEK of July 24, I felt my interest stirred. He expresses what as many of us have noted in the past 30 years of aviation. Don't want to be too critical, as we don't know just what communicatable barriers the designers and manufacturers face, but we do know that the Bonnie Lassie? have communicated.

Perhaps some day we will have cheaper, better, faster and more economical planes and flight strips (moderate size hangars—flight strips of 50 built from the gas tax which is collected on aviation gas). Let pilots and owners pick through the required red tape to collect this refund.

Perhaps planes will have folding wings so we can run them home and store them in our bedroom garages—we'd have to give the Mrs. a little more dough on how to give her the fault flower in alongside of. The advantage of this will be obvious to any one who has dug his plane out of the back end of a big hangar when he needed it in a hurry.

Would it be taking too much for a plane that we could get out of without waiting in a pressure? especially forward and aft, which are sometimes directions we have to go.

Lawler speaks of the Ultimate DX3. We used to call it a comfortable 90, but are pleased to find the Ultimate, which are powered and Lone the word benefit. In that much antiquated collection of bolts wouldn't even be a fair tug with one of the modern 90 horse engines and small, high speed prop. Don't get me wrong. I'm not advocating the urban to the DX3 but plugging for larger and slower prop. Also for a Mexico in the pocket gone mike.

Rex L. Grones
P.O. Box 27
Big Bear City, Calif.

From Vickers

In your Sept. 4 issue you covered the reorganization of Wilmot Aircraft Co. and stated that Clarence A. Sherman, then president, was . . . [illegible] . . . in charge of development and directing of aircraft hydraulic valves and actuators for Vickers, Inc.

Mr. Sherman did work for Vickers until about two months ago. He was however never "in charge of development and directing" of any of our aircraft products. He was a project engineer on some development work which he was doing on equipment for Douglas, Bell and Ryan, etc.

Thomas B. Dye, Jr., Manager
Aircraft Products Sales, Inc.
Vickers Incorporated
Division of the Sperry Corp.
1400 Oakton Boulevard
Oakton 25

(Our statement was based upon a conversation with Mr. Wilmot by Thomas E. Jackson, Jr., Boeing, Inc. Advertising of Detroit, Inc.)

Tigers' Profit

I have read Sally Alexander's article Sept. 4 issue, cover story. Some information about our company apparently was left to be found at the time he wrote it.

It is incorrect to say that we economically profitable from airfreight. In fact, the $148,000 and $244,000 based some profits of $125,000 and $150,000 respectively, were required, although not included, substantially to the net profit in 1948.

Gross revenue was 50 percent of total revenue in 1948-49 and 60% more than that the preceding year. We were strategic carriers. Thus could have been no profit despite excellent ship maintenance and overhead—incorporating various fact upon the final profit year?

We are making money off freight and all that maintenance and charter miscellaneous revenue. Our freight is a very efficient plant, now one of, if not, the highest and personnel—not without the medium of selectivity success. The plant could not produce profitably.

I would also like to point out that last February, or possibly before the Korean situation had any effect upon our operations, our stock was selling as high as $7.87 a share. This price was based upon an operation of 1,[illegible] time, most of which was flown directly to the military.

The present military operation is of course of prime importance and we are very happy to be able to make our contribution to it. In fact, that contribution should be much too had we not been flexible enough to round out our overall operations in the interim before Korea with the very hope of multiple and profitable operations personnel referred to namely a successful form of airfreight, maintenance and charter.

Lawrence S. Kronfeld,
Director of Public Relations
The Flying Tiger Line Inc.
Lockheed Air Terminal
Burbank, Calif.

Av. Wk. Pays Off

While holding our July 31 AVIATION WEEK we noticed an ad by Hines & Rowland Inc., aviation insurance underwriters. Based about the cover of Cessna 195 Serial No. 7[illegible].

The plane was here on the field so we immediately contacted Hinges & Rowland at Dallas Week. They in turn sent their representative down to inspect the airplane.

Consequently, a few days later we received a check for $1,100 on a conclusion with the award plan.

Our good Cessna was sold by AVIATION WEEK and we wanted you to know that we appreciate results for selling your magazine.

Burton E. Stevens
Nevada Aircraft Maintenance
Reno, Nevada

P. S. How about a check for one year's subscription renewal.

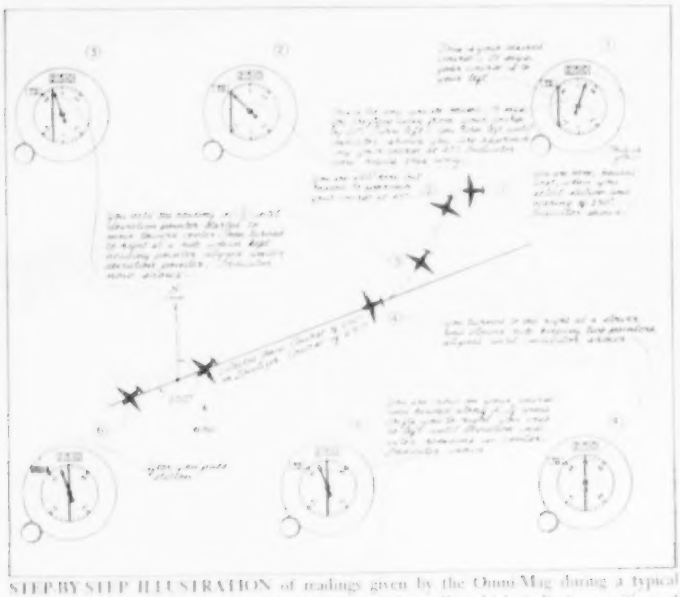
Credit to Link

In the July 31 AVIATION WEEK there is a very common article on some special training and purchase arrangements which we thought had actually found for the Air Materiel Command's Link group in the Air Materiel Command. I was sick the article is true to an reference to the fact that our company developed and built this equipment.

We are very proud of this job and which we have to be proud because on it we could do, among, to the Air industry, the most that we could and build such equipment for some years.

E. A. Wyrtzen, Vice President
Link Aviation, Inc.
Binghamton, N. Y.

(The Air Materiel Command failed to mention Link in its announcement. AVIATION WEEK is glad to give credit here to the company.—Ed.)



STEP BY STEP ILLUSTRATION of readings given by the Omni-Mag during a typical approach. Note linear displacement of the vertical needle which indicates position of desired runway.

Bendix' Three-in-One Flying Aid

"Omni-Mag" combines functions of three instruments; compact unit eases pilot's job when flying IFR.

By George L. Christian

"Omni-Mag," newest arrival in the growing family of electronic flying aids, has just been made available to the commercial airlines of the world.

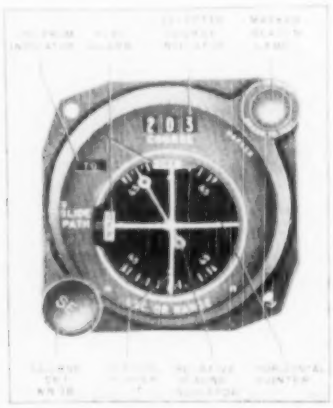
The unit has been purchased in quantity by the USAF for bomber installation, according to the manufacturer, Bendix Radio. It anticipates that fighters will soon mount the instrument.

Omni-Mag is the trademark contraction of omni-range, magnetic and ILS indicator. In the one instrument, a pilot is provided a continuous picture of his heading, course, approach, wind drift and glide path.

▶ **Pilot Fatigue**—The device was developed as a result of Air Materiel Command psychological tests investigating the best methods to reduce pilot fatigue while flying on instruments.

R. W. Fleming, of Bendix International, told AVIATION WEEK these studies revealed that combining instruments was highly desirable because movement of the pilot's eyes was reduced, thus retarding the onset of fatigue.

So the Baltimore division of Bendix Aviation Corp. went to work and came up with the predecessor of the Omni-Mag. The unit combined the functions of three instruments: the omni-bearing course selector (with "to-from" indication plus a marker beacon indicator for use with a single light system), the ILS cross pointer (deviation) indicator, and the magnetic heading indicator. The instrument worked, but was too big. After much effort, the dimensions were squeezed down to 7¼ in. square by 6 in. long, the weight reduced to 3¼ lb. and the list price set at $1275. This is the instrument Bendix is offering today.



Picture of Bendix' unit shows ingenious way of combining three instruments into one.

▶ **Flight Demonstration**—Although the unit may appear somewhat complicated at first glance, its functions are easily translatable into correct maneuvers as was noted in a demonstration flight made by this AVIATION WEEK correspondent in the company's Navion. After taking off from La Guardia, R. I. Daniels, Bendix Radio's aviation sales manager, covered the magnetic compass and master direction indicator with pieces of masking tape; there was no standard cross pointer indicator aboard. We were going to rely entirely on the Omni-Mag to lead us to Westchester County Airport, a field some 25 miles distant, equipped with an ILS installation.

Using the course set knob, Daniels set 016 degrees into the selected course indicator. This was the heading of the runway we wanted at the field. The relative heading indicator (needle pivoted at the center of the instrument) swung to an indication of 30 deg. left, and the vertical pointer moved full scale to the right. (Note: the vertical and horizontal pointers are pivoted so that they move linearly, as on the Sperry Zero Reader, instead of being pivoted at one end as in the conventional cross pointer indicator.) The instrument's "to-from" indicator showed "to."

Thus, at a glance, we obtained the following information: The plane's heading was 30 deg. to the left of the runway we were aiming for; the runway itself was off to our right; and we were heading towards the airport.

▶ **On To The Runway**—The plane was banked to the right until the relative heading indicator had swung from 30 deg. left to 45 deg. right. Now we were flying on a course which would lead us into an imaginary extension of the runway at a 45 deg. angle. However, as we approached the field, the vertical pointer slowly started moving towards the center of the instrument's dial.

The plane was turned left and

a degree of bank assumed which "inverted" the vertical pointer to the relative heading indicator. They were flown to the zero, or straight up position. By so doing, we had made an asymptotic approach to the desired course without overshoot or bracketing.

The vertical needle is your runway and as long as it is centered on the instrument, you are aligned with it. If the relative heading indicator should move right or left, say 10 deg., this tells you that you are "crabbing" that much to take care of cross winds.

The use of the horizontal needle for glide path tracking is conventional.

For cross country flying, the vertical needle is actuated by the omni-directional range receiver and becomes the radial you want to fly. Also, for long flights on which a desired magnetic track is to be held for some time, the course is set into the selected course window and the relative heading indicator is zeroed, no need to do any arithmetic—adding or subtracting headings to find your true course.

▶ **Omni-Mag Appeal**—Having pointed out a feature of the Omni-Mag which was attractive to the airline operator. Usually, he need buy only the instrument, the various receivers feeding the unit having been already installed in his aircraft.

The various components of the Omni-Mag are listed below, each followed by the unit or units which actuate it.

- **"To-from" indicator**—omni-directional range receiver.
- **Selected course indicator**—omni-directional range receiver, Flux gate (or Gyrosyn) compass or both.
- **Vertical pointer**—omni-directional range receiver or localizer receiver.
- **Horizontal pointer**—glide path receiver.
- **Relative heading indicator**—Flux gate (or Gyrosyn) compass.

Bendix is sure that its three-in-one instrument will have cast pilot appeal because of the real simplification it offers just when clarity is needed most: flying and especially landing under instrument conditions. Having stressed the point that the mere elimination of mental mathematics to determine correct course unclutters the pilot's mind to a considerable degree.

If this philosophy of simplification through consolidation is extended to other related groups of instruments, cockpits of modern airliners may again return to the simple and readable instrumentation which existed in yesterday's aircraft.

Several airlines, domestic and foreign, are studying the Omni-Mag according to Bendix, and many of the executive aircraft already have the instrument installed in them.

Galley Service Is Made Simpler

Northwest Airlines expects to save money and expedite food handling with its new, specially designed galley service truck. Drawing on frontier lore, NWA has dubbed the unit "chuck wagon."

Unique feature of the 14-ton truck is the steel body—12 ft. long, 8 ft. wide and 8 ft. high—which can be raised hydraulically from a height of 30 to 130 in. to bring the body level with the loading doors of a 2-0-2, DC-4 or Stratocruiser. An extendable platform on the cab roof is run out like a gang plank to the side of the plane to facilitate loading food and other passenger service items. Large capacity permits carrying, at one time, enough dinners to satisfy the appetites of several plane loads of passengers.

Additional convenience is a lift gate, also hydraulically operated, at the rear of the chuck wagon. Stacked with galley supplies when at ground level, the gate is raised to truck-door level for easy loading of supplies into the truck body.

Tenses Cables

Faster, more accurate compensation for temperature changes and fewer maintenance worries are promised in an improved cable-tension regulator produced by the Bendix Mfg. Corp.

The new regulator, a spring and hydraulic-operated unit which keeps aircraft cables at specified tension, preventing slack in controls or excessive tightness because of temperature changes, is designed to do a better job with these improvements:

- **Protective synthetic rubber** boot placed over the piston rod keeps out grit, sand and dirt.
- **Leather backups** added on both sides of the "O" rings used for packing keep dirt from penetrating to the "O" rings.
- **Longer-wearing "4130" steel** hard chrome plated, piston rod, honed to a 5 micro-finish replaces the stainless steel piston rod formerly used.

These and other improvements have greatly reduced internal friction in the unit and allowed opening up of the

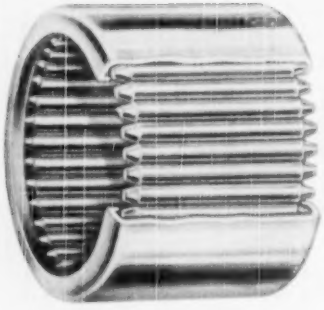
clearances on the internal valve, permitting much faster compensation for temperature changes, the company says. It adds that the new regulators have been laboratory tested for over 500,000 cycles without showing any sign of wear or leakage.

Beside the obvious advantage of keeping cables at the right tension despite temperature changes, Bendix claims that the unit permits low cable tension rigging of aircraft, thus reducing control friction and pilot fatigue. Compensation also is provided for tension changes caused by deflection on takeoff, for stretch in cable systems caused by long use and for slippy or taut cables caused by distortions in flight. Address: 1859 Blake Ave., Los Angeles 39, Calif.

known by the company they keep

This is one maxim that certainly applies in the case of Torrington Needle Bearings. The list of Needle Bearing users reads like a "Who's Who in American Industry." There's no better proof of the soundness of engineering embodied in Needle Bearings than their excellent performance in thousands of famous-name products.

In your automobile, lawnmower, outboard motor, sewing machine, hand drill . . . and in farm equipment, textile machines, machine tools, aircraft—Needle Bearings help ease your work and keep our economy going. Why not add your product to the growing list of those that benefit from Needle Bearing operation?



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NEW AVIATION PRODUCTS

Pressure Switches

A new line of lightweight pressure switches, including differential types, is being produced by the Aerotec Corp., Greenwich, Conn. The switches already are in use on military planes, the firm says.

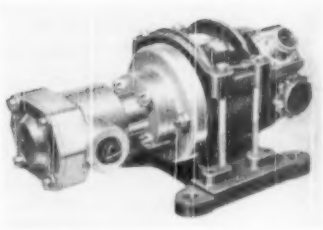
Over 60 different types of switches are included in the group, called the M-800 series. Some uses listed by Aerotec for these units:

- **To indicate high differential** pressure caused by dirty or iced fuel or hydraulic filters.
- **To indicate a suitable** pressure differential between tank pressure and the pressurized bay in which the tank is located.
- **Fuel or oil warning** switch, or as a safety switch in fuel pumping systems.
- **Control switch** for operation of fuel hose purging systems in flight refueling.

Among purchasers of this equipment, according to Aerotec, are Boeing Airplane Co., Lockheed Aircraft Corp., Grumman Aircraft Engineering Corp., and Northrop Aircraft, Inc. General Electric Co. also is expected to place a production order for these parts for use with its jet engines.

All switches are designed for use with nitric acid, liquid oxygen, water, alcohol, gasoline and hydraulic fluids. They are encased in explosion-proof housings and will operate at working pressures from 1 to 1000 psi.

- **Other specifications:** weight—about 0.9 lb.; electrical rating—1 to 4 amps., 28v. d.c., up to 60,000 ft. altitude; vibration and acceleration resistance—up to 500 cps. with 10G acceleration; envelope size—about 3⅞ in. long by 2¼ in. diameter; external adjustment—lockwired and lead-sealed; mounting—two studs, 10-32NF, 3⅞ in. long.



Air Pump

Newest addition to the line of aircraft equipment produced by the Aro Equipment Corp. is a dry air pump. This is an integral unit, Model C-10350, with an electric motor driving a vane-type, positive-displacement, air pump.

It is particularly suited for such applications as pressurizing radar chambers, since it requires no external source of lubrication and leaves the surrounding air free of oil fumes, Aro says.

The unit will deliver 1 cfm. of air, create an inlet suction of 4 in. Hg. and an outlet pressure of 1 in. Hg. It is designed to operate satisfactorily through an ambient temperature range from −65 to 140 F. The electric motor driving the device is built to conform with Specification AN-M-16a.

Operation of the pump under extreme cold conditions can be recommended, the firm explains, if a suitable desiccator is installed in the inlet line to dry the air. The desiccator normally is not required. Address: Bryan, Ohio.

Heli-Coil Insert Kit

Compact kits with tools for installing and extracting Heli-Coil screw thread inserts are available. Simplified kits can be made up for aviation and machine shop use.

Those for production work and field service provide an assortment of inserts for screw threads from No. 6 to 1¼ in. size in American National Coarse and Fine Series, as well as for tank plug and taper pipe thread sizes.

The special kit shown in col. one, main was designed for military field use. It contains a tap, an inserting tool, tang break-off and inserting tool, staking tool, an extracting tool and a supply of inserts for 14 mm. sparkplugs. Address: Heli-Coil Corp., 110th St., Long Island City 1, N. Y.

Cleans Oil Coolers

In line with expanding its list of chemical products for aircraft use, Fine Organics, Inc., has placed on the market a new desludging compound for oil coolers, tanks and float mechanisms.

The new cleaner, Stratonol N.O., reportedly is a completely new type, specifically designed to dissolve the heavy oil sludges and accumulated dirt which clog oil coolers. The company says it has high detergent and rinsing qualities, has a mild odor and is non-corrosive in nature.

It will remove oxide stains from aluminum surfaces, it adds, leaving them clean and bright, and may be used in standard surge-type cleaning machines in concentrated form at room temperature or in hot cleaning process (135-140 F.) after dilution with four parts of water. The product is freely miscible with petroleum solvents or water, the company says.

John B. Moore, the firm's manager, told AVIATION WEEK, "our field tests indicate that we achieved a very high degree of success in approaching this problem of cooler cleaning."

ALSO ON THE MARKET

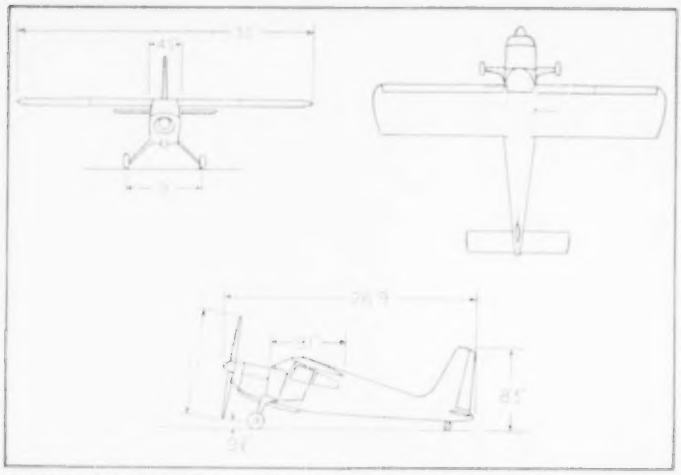
Improved resin adhesives for sealing shipping containers are designed to meet strength and water immersion requirements of latest military specifications concerning export packaging operations. Fast-setting varieties for machine use are available. Address: Paisley Products, Inc., 1770 Carolport Ave., Chicago 16.

Low inertia motors can be used for positive positioning in auto-bridge and auto-potentiometric circuits, or as remote positioners in servo mechanisms. These motors have application in such devices as guided missiles. Address: Brown Instruments division, Minneapolis-Honeywell Regulator Co., Wayne & Roberts Aves., Philadelphia 44.

Compact chain hoist reportedly weighs only half as much as conventional units of same capacity. One model, Load King 4-tonner, has 95-percent efficiency, enables one man to lift full load three feet in 20 seconds with ease, says the maker. It weighs 47 lb.; uses aluminum alloy castings. Friction is reduced by using ball bearings on all rotary shafts. Address: Philadelphia division, Yale & Towne Mfg. Co., 11400 Roosevelt Blvd., Philadelphia 15.

Radio noise suppressor capacitors are built to withstand wide range of temperatures, vibration and other conditions encountered in vehicular applications. Element is non-inductive, vacuum wax-impregnated to insure low power factor, high insulation resistance. It is contained in hermetically sealed case. Address: Cornell-Dubilier Electric Corp., South Plainfield, N. J.

SALES & SERVICE



PRODUCTION HELIOPLANE will have cleaner lines, fewer struts than prototype.

Defense Gets Helioplane Priority

Area marketing and contract servicing schemes revised, putting pleasure users on a low-priority basis.

Alert to the demand for a government critical materials allocation program, the makers of the four-place Helioplane have announced that the company is no longer taking orders from people who will use the slow flying plane only for pleasure. New orders will be considered only from persons who can show that they will use the plane for essential defense or civilian needs.

In line with this new policy the company has revised previous distribution plans for area-by-area market expansion (AVIATION WEEK May 22, p. 39).

Orders that have already been placed from pleasure users will be honored under present conditions.

Helio had planned to restrict introduction of the plane to selected areas having service bases which would handle the special service and maintenance contract to go along with the plane.

But now the company is booking orders immediately, regardless of location, hoping to establish such service facilities while new orders are in production.

▶ **New Plans**—Subject to priority of military and defense needs, the first 100 Helioplanes produced will be delivered to selected market-test areas in Boston, New York, Cleveland, Detroit and Chicago where service bases are being set up. It is pointed out that the company is now assured of sufficient materials to complete this program. Orders from essential users would put the company in a position to claim materials priority which would be needed to continue production in an emergency period.

In other parts of the U. S., until authorized bases are established, orders for essential needs are being accepted directly by the Helio Aircraft Corp., Norwood, Mass. Deliveries and service responsibilities will be channeled through interim local dealers.

Factory price plus a fee scaled to meet services required will be charged government and high priority industry users. Orders are currently being booked at $8800 F.A.F. The service fee will be passed on to the local sales and service base. Helio is accepting deposits of $500 to be banked in escrow in the purchaser's name, with an additional $1000 due when production of the customer's specific plane has begun, and the balance payable when his plane is ready for delivery.

The company counts on making initial deliveries before the first of next year.

▶ **Specifications**—Figures for the four-placer, to be powered by a 145-hp. Continental, give it an empty weight of 1212 lb., and a gross of 2062 lb. Top speed at 5000 ft. is over 140 mph., cruising speed at the same altitude is over 125 mph., and minimum level flight speed is under 30 mph. Takeoff and landing distances are under 50 yd. Takeoff and landing over a 50-ft. obstacle is given as under 150 yd. Figures are with full gross weight, and Helio is guaranteeing them within five percent.

Standard equipment will include starter and radio shielding for the engine, variable-pitch eleven-foot prop, shoulder and lap-type safety belts, hydraulic brakes, navigation lights, standard contact flight panel, ejector-type engine muffler, and cabin heater. Fabric covering and interior trim will be fire resistant.

Flights of the production prototype, originally slated for early September, have been held up awaiting receipt of an engine from Lycoming.

Fixed Basers Meet

Airport operators are slated to give their problems a good going over during a two-day meeting starting Oct. 17 at the Hotel Onondaga at Syracuse, N. Y. Highlighting the sessions will be a demonstration of present day techniques in fighting airplane fires to be held at the local Hancock Airport, using inexpensive and readily obtainable equipment.

The conference is being sponsored by the N. Y. State Department of Commerce in cooperation with the N. Y. State Aviation Council, N. Y. Aviation Trades Assn., and municipal official groups.

Talks will cover aviation trends in New York State, trends in personal planes, petroleum marketing problems, successful fixed-base operations and airline-airport relationships.

BRIEFING FOR DEALERS AND DISTRIBUTORS

▶ **Pilot's Handbook**—A compact (about 3 x 6 in.) 80-page booklet covering pilots' Civil Air Regulations Parts 20, 29, 43, 60 and 62 is available from Ross Publications, P.O. Box 2092, Arlington 4, Va. It costs 35 cents. Distributors get a discount for quantity orders.

▶ **Westinghouse Service Station**—Aircraft Maintenance International, Inc., Idlewild Airport, N. Y., has been named as an approved service station for overhaul of Westinghouse Electric aircraft apparatus.

FINANCIAL

NAL Comeback Wipes Out Debt

Carrier reports record profits, but its claims to title of "fastest growing" line are disputable.

A material recovery in earnings and financial position is reported by National Airlines, Inc. For the fiscal year ended June 30, 1950, the carrier showed a record profit of $558,269. This compared with a net of $38,963 for the 1949 fiscal period and a net loss of $2,309,000 reported for the 1948 fiscal year.

National's current 1950 fiscal year earnings were not subject to any federal taxes due to the carry-back tax credits arising from the heavy losses of prior periods. In other words, if the company paid the full 38-percent tax impost, its 1950 fiscal year earnings would have been only $346,127 or 35 cents per share instead of the 56 cents actually reported.

Revenues in 1950 of $15,910,123 were revealed as the highest in the company's history, topping the 1949 results by 25 percent. Improved control over expenses was reported in a reduction from $1.395 per revenue plane mile in 1949 to $1.267 per revenue plane mile in 1950.

▶ **Fastest Growing?**—National lays claim to being the fastest growing airline in the nation, "based on the latest available figures." It asserted that its revenue ton miles increased 35.9 percent for the year ended Mar. 31, 1950, while the nearest airline gained 35.4 percent and its "biggest East Coast competitor" (Eastern) showed an increase of only 9.9 percent.

This assertion, while technically correct, is subject to a number of major qualifications. The base period used by National in measuring results is most unusual. It does not allow for the current improvement in results for other carriers whose normal seasonal peaks come later in the year.

Of greater significance in the National figures is the nature of its comparative periods. National was subject to a pilots' strike from February through November, 1948. Even after that date, traffic had to be restored on a gradual basis and operations were subject to a number of adjustments.

In other words, for the year ended June 30, 1949, National's operations were far from "normal" and hardly represent a fair base from which to make a comparison. The fact remains that for the fiscal year ended June 30, 1947, National flew more revenue ton miles than it did in the same periods for 1948 or 1949.

Accordingly, the substantial recovery in 1950 fiscal results can hardly be construed as a fair measure over the previous year's accomplishment in evaluating "normal" growth trends for National itself or even in comparison with other carriers.

This is not to detract from National's excellent comeback. For the five months ended Nov. 30, 1949, National showed a loss of $898,579. Yet, by June 30, 1950, seven months later and at the end of its fiscal year, the company had not only made up this entire loss but showed a profit of $558,269.

▶ **Available Miles**—Throughout the National report there are pointed references to its "nearest" competitor, Eastern, without that carrier actually being named. For example, National again uses the nine-month period ended Mar. 31, 1950, in measuring operating costs per available revenue ton mile. On this basis, National shows an average cost of 24.4 cents against its "nearest" competitor's 24.7 cents and an industry average of 29.1 cents. Again, this nine-month period appears to be arbitrary.

Moreover, a good question presents itself. Why use "available" ton miles?

Many observers feel that actual ton miles flown is a more revealing measure. Certainly, the Civil Aeronautics Board in various mail rate proceedings has frequently looked askance upon over-scheduling through the available ton miles.

For the twelve months ended Mar. 31, 1950, the latest published by the CAB, it is revealed that on the basis of revenue ton miles flown, National averaged a cost of 60.66 cents per ton mile while Eastern showed a cost of 52.28 cents.

▶ **Mail Dependence Down**—National continued to cut down its dependence upon mail compensation. During the 1949 fiscal year, it received 16.7 percent of its total revenues from mail compensation. For the 1950 period, this ratio was reduced to 11.22 percent. Eastern, on the other hand, received but 4.7 percent of its 1949 revenues from mail compensation. Further, while National is currently averaging some $3.72 per revenue ton mile for carrying the mail, Eastern derives but 60.00 cents per revenue ton mile for the same service.

A material improvement in National's financial position was accomplished during its most recent fiscal year. In May, 1950, the company made the final payment on its long-term debt, representing retirement two years ahead of schedule. This was a noteworthy accomplishment when it is realized that total debt due the banks stood at more than $1,575,000 at June 30, 1949, and at $2,846,094 on June 30, 1948. Heavy depreciation run-offs are, of course, an important source of cash, averaging around $1,400,000 in each of the past two fiscal years.

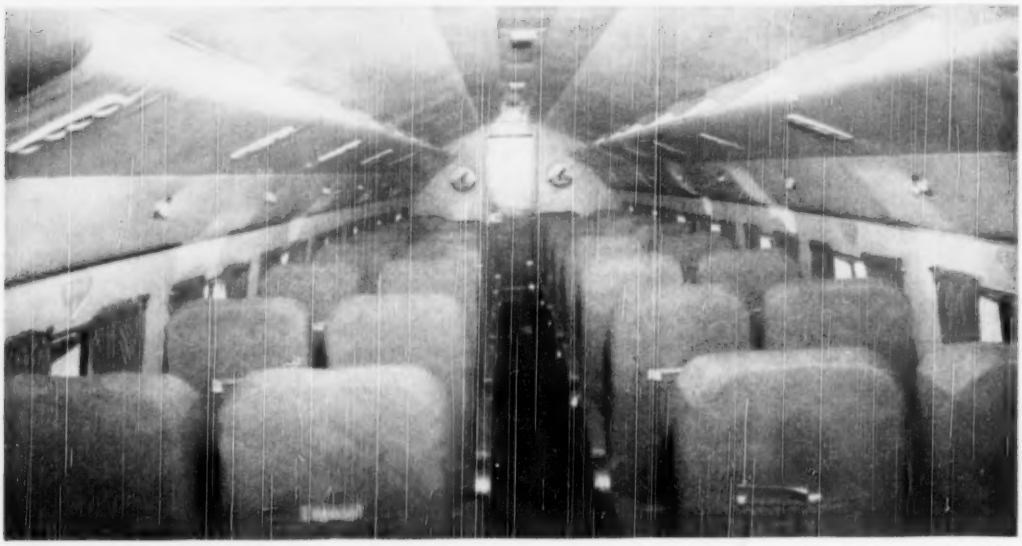
As of June 30, 1950, National showed a net working capital of $1,844,768. The company has agreed to purchase four DC-6A-68-passenger air coach-type planes—at a total cost of $3,518,000. Progress payments of $459,056 had been made toward this purchase by June 30, 1950. Bank loans aggregating $2 million were obtained in July, 1950, to finance total payments of the two aircraft, valued at $1,752,085 which were delivered during that month. Presumably, additional bank loans may be required to finance the acquisition of the remaining two aircraft. A chattel mortgage covering certain aircraft and spare engines and propellers owned at June 30, 1950, was pledged as collateral to the demand notes issued to the banks in this financing.

▶ **Selling Campaign**—A highly significant trend is in evidence of National's attempt to overcome the seasonal declines so peculiar to most air carrier operations. For example, a $140,000 loss in May, 1949 was cut to $22,000 in May, 1950. While more than $400,000 was lost in June and August last year, a profit of around $130,000 was shown for the same months this year. The loss for July, 1949, approached $100,000. This year, the July operations showed a profit of almost $50,000.

All told, there is an $500,000 difference between the four-month loss last year and the profit this summer. This accomplishment is largely the result of a very aggressive promotional campaign designed to stimulate traffic during the summer months. This included prominent use of air coach and excursion fares together with vigorously promoted low-cost package tours.

A new promotional aspect is present in the company's Industrial Information Bureau. This unit is designed to bring new industrial developments to the southern cities served by National. This activity has long been well established by railroads and has led to stimulation of much traffic. The National attempt in this direction is the first ever tried by an airline.

—Selig Altschul



SUPER DC-3 INTERIOR seats 31, with rearward facing seat against forward lefthand bulkhead. Radio speakers are between ceiling lights.

Why Capital Is Pleased by Super DC-3

Operating cost looks low, time saved on ground is considerable, and passengers are favoring the plane.

Douglas Aircraft's latest bid in the shorthaul plane equipment field is doing fine. The Super DC-3 came into the airline world less than three months ago. And already its owner, Capital Airlines, wishes it had more.

It's too early to evaluate actual maintenance cost—and there may yet be some bugs riding the Super-3.

But so far, the Super-3 flies faster, costs less to operate, and handles easier than Capital President J. H. Carmichael expected when he placed the initial and only airline order to date. That was last year—for three planes. They're the only ones you will see in commercial operation for a long time to come.

▶ **Early Report**—Of course maintenance is negligible right now, on such new equipment.

Utilization of plane is also low, because of pilot training. But here is what is known of the Super-3 operation so far.

• **Flight operation** and flight maintenance cost is 38 cents per plane mile, 1.23 cents per passenger mile, according to Capital Comptroller S. B. Goldthorpe.

• **Super-3 flight operating** cost is figured at $57.72 an hour by Capital cost accountants.

The maintenance of flight equipment is figured at $15 an hour, making direct flying operation cost $72.72 an hour, excluding depreciation.

• **Average flying speed** on a typical Capital run is placed at 191.4 mph., based on 30 hours' operation in July. (August figures have not yet been completed by Capital accountants.) This speed is the average from point of takeoff to landing, excludes ramp to runway taxi and waiting time.

So Capital estimates Super-3 direct operating cost at 38 cents per plane mile on its scheduled operation.

Capital's estimate of 38 cents per plane mile compares with 38.40 cents for its DC-3s. It is well under the Convair Liner's 56.32 cents and the Martin 2-0-2's 56.96 cents (industry average, Gotlieb & Crawford's Air Carrier Analysis, fourth quarter 1949).

Depreciation is excluded from these figures.

Converting to cost per seat mile (capacity), you get: Super-3 (31 seats), 1.23 cents a passenger mile; Convair (40 seats) 1.41 cents; Martin 2-0-2 (36 seats) 1.58 cents; DC-3 (21 seats) 1.86 cents; and Capital-modified DC-3 (24 seats) 1.62 cents.

▶ **Schedule Time**—Here are comparative schedule times on the one route where direct comparison of Super-3 with other craft is possible—from Memphis to Knoxville (Capital route is 358 miles with one intermediate stop at Chattanooga; American Airlines route is 352 miles with one stop at Nashville).

Capital's Super-3 makes it in scheduled time of 1 hr., 37 min. American's Convair-Liner takes 15 minutes longer—2 hr., 10 min. (Official Airline Guide). Chief reason for Super-3's edge is its short ground time; Capital's schedule calls for only 2 min. ground time at Chattanooga, while American's Convair stops 18 min.

But even excluding ground time, the schedules speed for the passenger, terminal-to-terminal, from Memphis to Knoxville, is 187 mph. on the Super-3, and 189 mph. on the Convair.

▶ **Ground Loading**—On most intermediate stops (except fueling) the Super-3 takes only 2 min. loading time. Here's how Capital does it:

• **Pilot cuts only one engine**, because single cargo hatch is in the rear, on left side behind passenger door.

How to Load and Leave in 2 Minutes Flat . . .

ONLY LEFT engine is cut as integral stair door is dropped and . . .

PASSENGERS ENTER while attendant loads cargo. Then . . .

DOOR IS CLOSED, engine started and . . .

PLANE PULLS AWAY (left background), two minutes after loading began. After takeoff . . .

• **Flight attendant lowers** the integral passenger ramp from inside the plane. So passengers step aboard quickly with no assisting ground crew needed.

• **Ground crew runs** baggage car up to the cargo hatch. The floor of the cargo bin is level with that of the car, to eliminate heavy lifting. Even the heaviest suitcase can be dragged by one man across the cargo floor and onto the truck in second or two.

• **Cargo handling** is also fast because there is no sorting. During the flight, the steward has already entered the cargo bin and placed by the door the cargo to be unloaded. After takeoff on the next hop, he does the same thing.

On the Norfolk to Memphis run, Capital's scheduled ground times for the Super 3 at the 10 intermediate stops are 2 min. each at six stops, 3 min. at two stops, 11 min. at one and 16 min. at the last (these last two are fueling stops). That is a total of 45 minutes or an average of 4½ min. ground time per stop, including two fuelings. On the same route, total ground time for regular DC-3 is 1 hr., 40 min.

▶ **Popular**—Passengers accustomed to

STEWARD SORTS BAGGAGE in flight to be ready for quick unloading at next stop.

longer waits at intermediate stops are pleased by the improvement on Super-3 trips.

Passenger conversation reaching Capital ears gives the Super-3 a good popularity rating.

Regular customers on Capital's grasshopper runs know the Super-3 already. And ticket agents report they try hard to get on the Super-3, in preference to the DC-3.

Besides the short ground time, passengers note its improvement over the DC-3 in speed, pick-up, looks, steadiness in flight, comfort. Although the seats are narrower, they are more comfortable—except perhaps for the very stout passenger. The seats' modern contour design, backed by thick foam rubber, accounts for the greater comfort.

▶ **Super-3's Place**—According to Capital Airlines, the Super-3 is the best plane now available in these categories:

- **Where traffic potential** is in the range from 15 to 31 passengers.
- **Where intermediate stops** are less than 100 miles apart.
- **Where runways are too short** to schedule planes like the Convair or Martin 2-0-2 without weight restriction (for example, Newport News, Va.).
- **Where a plane is needed** having postwar design, quality and economy.
- **Where low initial cost** is important. Rough estimate of present cost of Super-3 is $275,000 and up, ready to operate. (That is the cost of rebuilding the DC-3 you supply).
- **Where low operating** cost is also important. Present Capital estimate puts Super-3's flight operation and maintenance cost at 38 cents a plane mile, 1.27 cents a passenger mile, fully loaded.

Says "Slim" Carmichael: "Any short-haul operation having stops less than 100 miles apart might well consider the Super-3 in preference to any other commercial plane presently available or in sight."

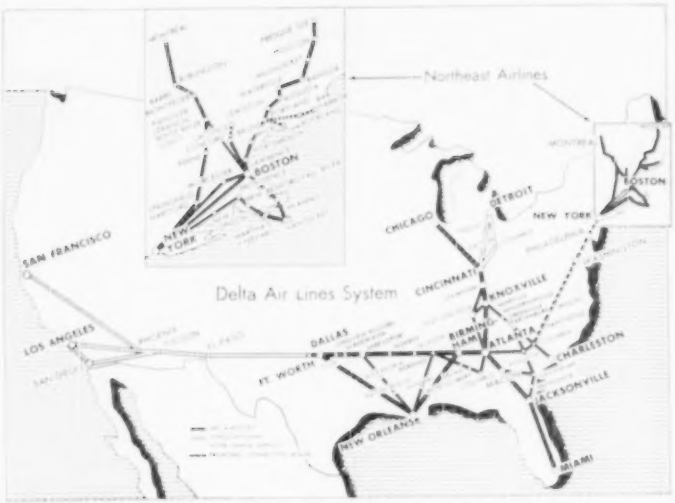
▶ **Flyability**—J. B. Franklin, Capital operations, says the Super-3 meets all the CAA transport requirements. The plane handles easier than any other that Capital has ever operated, he says. Here are the outstanding flight characteristics, according to Capital experience:

- **Takes off easily** on one engine. On a scheduled flight a month ago, an engine acted up just after takeoff and the pilot shut it down and feathered the propeller. He climbed on one engine and took his place in the landing stack over Washington Airport.
- **Takes off and lands** about 5 mph faster than the DC-3. The difference is negligible from a pilot standpoint.
- **Stall characteristics** are good. The new wing design eliminates the wing-tip stall of the DC-3.
- **The plane cruises** about 50 mph faster than the DC-3. It cruises about the same as or a little faster than the DC-4, using comparable percent of power.
- **Recommended climbing speed** is 130 mph., with rate of climb 850 fpm.
- **Range** is about the same as a DC-3, carrying the same fuel load.
- **Center-of-gravity** range is 11 in. forward to 37 in. aft of mean aerodynamic chord.

With no passengers, the plane will carry 1700 lb. cargo in rear cargo bin with no worry about weight and balance. (Cargo maximum in this bin with 31 passengers aboard is 2300 lb.)

- **A DC-3 pilot can check** out fully in a Super-3 in 7 hours or less, including instrumentation and ILS approach.
- **Internal control-locking** mechanism locks throttles, as well as all control surfaces. Pilot could never take off with controls locked.

▶ **Limitations**—While Capital appears overjoyed with its new plane, Carmichael is first to admit certain limitations in it. He points out that the Super-3 is not the perfect replacement for the DC-3; it's more of a stop-gap



NEA-Delta Merger Is Proposed

Floyd Odlum's Atlas Corp. is making a new attempt at painless compliance with the Civil Aeronautics Board's order to divest itself of control of Northeast Airlines; it would merge NEA with Delta Air Lines.

Delta likes the idea, too, for it sees in the proposal a possible way to fulfill one of its own long-held ambitions; to get entry into New York City.

The two carriers have filed with CAB their intention to merge, contingent upon CAB's granting a route to Delta which would link New York with Columbia, S. C., via Fayetteville and Wilson, N. C.; Washington, D. C., Philadelphia and Newark. Delta has had an application for this route pending since February, 1949.

▶ **Changing Interests**—The Atlas Corp. for a long time has been under CAB order to get rid of its controlling interest in NEA. To sell the stock on the open market would be too costly. The agreement to merge provides that Atlas will surrender Northeast stock in exchange for Delta stock in a ratio based on the book values of the two companies. Odlum would end up with stock in both companies and control of neither.

Advantages of the merger cited by the companies are:

- **It would strengthen** present local service of both systems, since it would open up important direct outlets on either one to customers in the territory of the other.
- **It would help iron out** seasonal peaks of both companies. NEA's peak loads are in summer; Delta's in winter.
- **Rotation of flight** equipment and other economies would be possible.
- **Traffic of the two lines** would be increased more than 50 percent, and a large portion of the added traffic would be new, rather than diverted, according to Delta.

If the merger and the New York-Columbia route is approved by CAB, the combination would be the fifth largest domestic airline. NEA serves 34 New England cities, with 1051 unduplicated route miles. Delta serves 36 cities in 13 states, with routes totaling 3937 miles.

in that line. But it is a brand new carrier in the 25-31 passenger range.

It is not really modern—the replacement of the DC-3, according to Carmichael, should have tricycle landing gear, pressurized cabin, the latest equipment built right in, and a 1950 airfoil.

But, say all the Capital executives, the Super-3 is even better than they expected. It does a job nothing else will. And there's not another plane in sight to do the job they need done.

▶ **Want More**—Capital Treasurer R. G. Lochiel says he is waiting for the cash before building more Super-3s. By the time Capital has the money, Operations Vice President Franklin will have finished his evaluation of Super-3. That time is approaching fast.

Douglas plans to make kits by which airlines may convert their own DC-3s. But Douglas can still do a factory job for those who may want them. That is in addition to its 100-plane Navy order.

Capital Treasurer Lochiel says that about Jan. 1, 1951, will probably be the time for Capital to decide whether to acquire more Super-3s. If they decide to go ahead, they will undertake conversion of "a substantial part" of their DC-3 fleet. The first batch might be the nine Super-3s they put in a tentative bid for last year.

Douglas' price for Super-3 conversion job has not changed from the original $260,000 for the airframe—at least officially. And Capital says the cost would probably be about the same to do the job using Douglas-supplied conversion kit.

▶ **No Other Way**—As for the idea of building the capacity of the old DC-3 to 26 or 28 passengers, Capital has this to say: it's been tried off and on over the past 10 years. But somehow it is no good except perhaps on some special route requirements, such as extremely short hauls with no cargo.

Douglas engineers studied the problem, and came up with the Super-3 design. It's more than a conversion job, it is a new plane, according to CAA certification. And there is no easier way to get a plane that meets the requirements of Capital Airlines.

A typical route operated by a Capital Super-3 is Flight 201 from Washington to Memphis via Norfolk, Elizabeth City, Rocky Mount, Raleigh-Durham, Greensboro, Winston-Salem, Charlotte, Asheville, Knoxville, Chattanooga, and Huntsville.

It leaves Washington at 6:50 am EST and arrives at Memphis 1:25 pm CST. Total time is 7 hr., 35 min. Route mileage is 1033 mi. This is the total of intermediate trip lengths: 143 mi., 44, 91, 57, 66, 16, 75, 95, 88, 87, 85, and 194 mi., respectively. That is a scheduled speed average of 130 mph., including ground time.

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Grumman's latest planes, still shrouded in security, will employ Aerotec controls.

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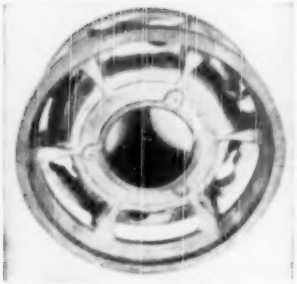

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SHORTLINES

▶ **Alaska Coastal Airlines**—Mail pay rate was raised to a base of 35 cents a plane mile for June-September, and 75 cents for October-March each year, starting last June. Daily mileage base for June-September is 1450 miles, October-March, 1144 miles.

▶ **All American Airways**—Stockholders reelected all directors for another year's term. . . . Has resumed service to State College, Pa., on its Pittsburgh-New York route following improvement of the airport.

▶ **American Airlines**—Started a second section of its coast-to-coast DC-6 coach service on weekends.

▶ **Associated Aviation Underwriters**—Will soon offer increased coverage at its coin-operated insurance vending machines. Revised policies will provide $50 of medical indemnity with each $1000 of principal bought. Geographical limits are extended to cover Canada, Mexico, Alaska, Hawaii and most of the Caribbean area.

▶ **Braniff International Airways**—Plans to increase service to Latin America within the next 60 days. . . . Carrier will fly 17 football-team charters this year, including five Southwest Conference clubs.

▶ **British Overseas Airways**—Has set up a Comet Flight Unit to train air crews and ground staff for introduction of the 14 de Havilland Comet jet transports on order for use on scheduled routes.

▶ **California Central**—The uncertificated intrastate carrier has added a 77-passenger DC-4 to its fleet of five DC-3s. The four-engine ship will be used on the San Fran.-Los Angeles run.

▶ **Colonial Airlines**—Has announced a family fare plan between New York, Montreal and Ottawa, in effect from midnight Sundays to midnight Wednesdays. Husband or wife pays full fare, accompanying spouse half-fare, and children between 12 and 21 also half-fare.

▶ **El Al Israel National Airlines**—Is helping take home Catholic Holy Year Pilgrims stranded in Europe by diversion of a chartered aircraft to the Pacific Airlift.

▶ **Ellis Air Lines**—Mail pay has been raised to a base rate of 50 cents a plane

mile, April-September each year, starting Aug. 18, 1950; and 80 cents a plane mile October-March each year, starting this year. Daily designated mileage base is 690 miles.

▶ **Flying Tiger Line**—Has inaugurated airfreight service to Rochester, N. Y., and Providence, R. I.

▶ **Mid-Continent Airlines**—Has started service with three DC-3s on its new Sioux City-Chicago and Rockford-Milwaukee route. Two roundtrips daily put Sioux City within 3 hr., 35 min. of Chicago and 3 hr., 45 min. of Milwaukee.

▶ **Mid-West Airlines**—Has just started scheduled service to Columbus, Neb.—28th city served by the feeder.

▶ **Pan American World Airways**—Is spending over $200,000 expanding its Miami overhaul base to take care of planes acquired through the American Overseas Airlines merger. . . . PanAm is putting on a sales contest for personnel of its Latin American division and affiliated carriers and travel agents. Contest runs Oct. 1 through Nov. 30.

▶ **KLM Royal Dutch Airlines**—Is modifying its 12 Convair-Liners for a gross weight of 41,790 lb. Modification is mainly strengthening the main and rear wing spars and the nose landing gear.

▶ **Seaboard & Western Airlines**—Awarded Lockheed Aircraft Service International a contract for conversion of a C-54A to a C-54E, with attendant fuel system, interior, and fire prevention modifications.

▶ **Swissair**—Will get an annual subsidy of 500,000 francs if a Swiss cabinet proposed bill is voted by Parliament. The company lost 5,000,000 francs last year. Switzerland may also buy ten of Swissair's planes for 52,500,000 francs. The company would still fly them and pay a fee based on utilization.

▶ **Trans-Texas Airways**—Got temporary mail pay rate from CAB calculated to give a pre-tax profit margin of 3.54 cents per revenue plane mile—2.19 cents net income after Federal income taxes. This gives the company a profit margin similar to other feederlines. But it gives more than 8-percent return on capital investment. So CAB concurs in Postmaster General's recommendation that "excess profits" over a "fair return" on carriers' investment shall be placed in an "earnings equalization reserve."

▶ **Trans World Airlines**—Began regular service to London and Frankfurt Sept. 30, following successful State Depart-

Artist's conception of Convair-Turboliner

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FASTEST THING IN aircraft FASTENINGS

36 HARTMAN RELAYS PROTECT BOEING'S B-47 BOMBER

J&H GC-18 28-Volt Control Panel.
Photo: Courtesy Jack & Heintz Precision Industries, Inc.

Mindful of the lightweight efficiency and trouble-free performance of Hartman reverse current cut-outs and other d-c devices in military and civil aircraft, Jack & Heintz called on Hartman to supply vital relays for the J&H GC-18 control panel installed in the Stratojet.

Each of the aircraft's six generators is protected and regulated by an individual GC-18 control panel equipped with five Hartman relays:

(1) Differential-Voltage and Reverse-Current Relay—Connects generator to bus when generator voltage exceeds battery voltage; disconnects generator from bus upon reversal of current.

(2) Ground Fault Relay—Senses ground fault; when fault exceeds set value, relay de-energizes generator.

(3) Overvoltage Selector Relay—Senses load current to detect generator producing overvoltage and automatically sets its overvoltage relay to trip at lower voltage than other five relays.

(4) Equalizer Relay—Disconnects regulator equalizing circuit from equalizer bus to avoid pulling system voltage down when generator is inoperative.

(5) Overvoltage Relay—Senses overvoltage and cuts out generator. Relay has inverse time characteristics to prevent nuisance trips.

(6) Contactor and Dropout Relay *(Not Shown)*—Located in fuselage near main bus, six of these compact units, each controlled by a GC-18 panel, connect and disconnect generators from bus during both starting and generating conditions.

Typical of Hartman design and manufacture, relays in the B-47 are just a few of the many d-c devices engineered for the aircraft industry. Whenever your problem involves d-c controls, turn it over to Hartman where it will receive prompt attention . . . where it will be analyzed and engineered with an efficiency that comes from nearly half a century of specialization.

A 7858

the Hartman Electrical Mfg. co.
MANSFIELD, OHIO

ment negotiations with England and Germany for the TWA routes. London flights leave LaGuardia daily except Sunday, and those leaving Mondays, Wednesdays, Thursdays and Saturdays go on from London to Frankfurt.

TWA sent 40 press representatives and other guests on a junket in a Connie Sept. 27—from New York to London and Frankfurt—to preview the new route.

CAB SCHEDULE

Oct. 9—Hearing in Latin American air freight case. (Docket 2893 et al)

Oct. 10—Oral argument on new southern service to the West. (Docket 1102 et al)

Oct. 10—Prehearing conference on service to Mason City, Iowa. Postponed from Sept. 13. (Docket 3281)

Oct. 16—Hearing on TWA and American Overseas Airlines requests to suspend service at Philadelphia on trans-Atlantic routes. Postponed from Sept. 18. (Docket 4228 et al)

Oct. 16—Hearing on extension of Los Angeles Airways helicopter mail certificate and for additional authority to carry passengers. (Docket 3809)

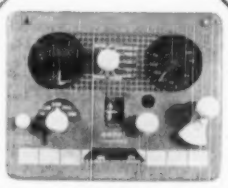
Oct. 30—Hearing on Lehman Brothers' interlocking relationships case, involving partners of firm holding airline directorships. Postponed from Sept. 11. (Docket 3876 et al)

Nov. 7—Hearing on application of Compania Dominicana de Aviacion for foreign air carrier permit from Ciudad Trujillo, Dominican Republic, to San Juan and Miami. (Docket 4264)

Dec. 11—Hearing on CAB's investigation of West Coast passenger fare structure. (Docket 4386)

Jan. 8, 1951—Hearing in Big Four mail rate case. (Docket 2849 et al)

THE narco Omnigator



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WHAT'S NEW

Travel Survey

An impressive-looking report of an air travel market survey just issued by Douglas Aircraft Co. confirms some popular opinions about air travel. But it suffers from a fault common to so many such reports: it does not tell you what questions were asked, and it offers conclusions not borne out by the survey results shown.

The report is labeled **Summary of an Analysis** made by Stewart, Dougall & Associates for Douglas. It tabulates the results of 2000 interviews with air travelers at 31 selected airports, and 3009 interviews with the general public in 46 cities. Possibly the two most significant facts emerging are not new: most travelers making more than 11 air trips in 1949 were in the upper income bracket ($10,000 and over), and 10 percent of those who flew accounted for more than 50 percent of all revenue flights.

It was also found that people who did not fly think that air travel costs more than it actually does, and that air travelers in the $5000 and under income group accounted for 40 percent of non-scheduled air travel.

The report concludes that 19 million persons are "ready to fly." But from the information presented in the summary it is difficult to tell how that figure was determined.

The report also states that 21 million persons who did not fly in 1949 "favor air travel." A fair question is how do you know that someone who has never flown favors air travel?

New Publications

"Because of developments in this atomic age, the United States can no longer be free from the danger of a sudden devastating attack against the homeland. . . . An enemy attack would presumably be aimed at the great metropolitan areas . . . at the country's most critical targets." With this warning, the National Security Resources Board, opens **United States Civil Defense**, its outline of a plan for organization and techniques which should be developed by state and local communities bearing the responsibility for civil defense.

The plan, outlined in the 162-page guide, builds upon the wartime experiences of Great Britain and Germany, as well as upon previous planning by various U.S. agencies.

Available from the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C., price 25 cents per copy.

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WEIGHT ENGINEERS

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POSITIONS VACANT

SALES ENGINEER needed by Manufacturers Agent, handling commercial and military equipment from New York office. Have opportunity for experienced man. P-7002, Aviation Week.

CO-PILOT-MECHANIC—Thoroughly experienced, for Douglas Bonanza. A & E. Commercial and reasonable amount of flying need extended contract. Apply in New York Met. Area. Reply to P-7001, Aviation Week.

POSITIONS WANTED

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POSITION WANTED—Twelve years aviation experience, as Pilot, C.A.A. Airway Examiner, Test Pilot, U.S. Department Agr., A.T.C. Instructor, Chief Pilot, A.T.C. Age 37. Prefer employed in Southern or Southwest area. Desire contact for flying or engineering duties. Experienced in supervising maintenance, operations. P-7000, Aviation Week.

CALCULATOR—Experienced in flight analysis, A.R.C. Mach Technique, Flight Guide Data, Cruise, Climb, Performance, etc. Can take charge of Backgrounds and computations, preparation of reports. Age 34. Available about Dec. 1. P-7000, Aviation Week.

(Continued on page 58)

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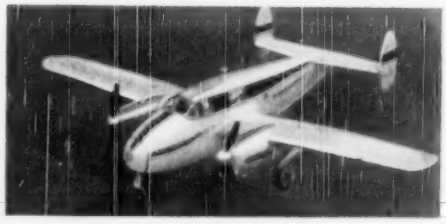

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Of Aviation Week, published Weekly at Albany, New York, for October 1, 1950.

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By J. G. JOLSTEIN, Sec. Treas. & Treas.

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(My commission expires March 30, 1952.)

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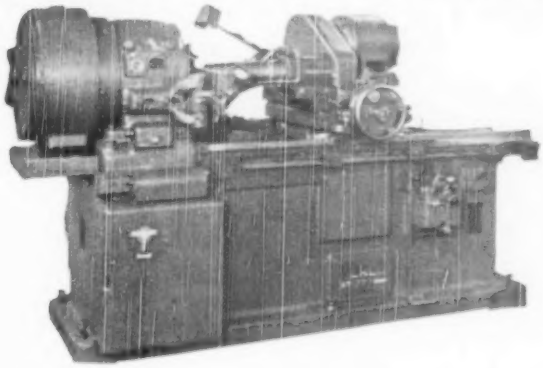

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NEW ADVERTISEMENTS received Friday will appear in the issue mailed the following Friday subject to limitation of space available.

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Let's not make the big—and costly—mistake, then, of generalizing on religious or racial groups. Adopt and *carry out* these common sense principles:

1. Accept—or reject—people on *their individual worth*.
2. Don't listen to or spread rumors against a race or a religion.
3. Speak up, wherever we are, *against* prejudice. Work for understanding.

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EDITORIAL

Business As Usual

A keen observer remarked the other day, "I wonder when CAB will smell the smoke of a blazing world and decide that we are in a war economy, like it or not."

He noted that most other government agencies have been busy, at least in press releases and speeches, assuring John Public that they are changing their sights and gearing up to a warmer war.

But at CAB, everything seems still to be "business as usual."

Nowhere has this been more apparent than the recent examiner's report on the long-delayed U. S.-Europe-Middle East Cargo Service Case.

In it CAB is still fighting the battle for the status quo against such bugaboos as traffic diversion, possible bankruptcy for the unwary, unknown applicants, and doubtful futures of commercial air cargo over the world's most important international seaway and airway, the North Atlantic. The report is doddering, short-sighted, inconsistent and bumbling.

In this case, two irregular carriers request certificates to operate cargo-only services without a nickel's subsidy from the government. The lines are Seaboard & Western Airlines, Inc., and Transocean Air Lines, Inc., both of which, incidentally, have set the dangerous precedent of having operated at a profit almost since their ex-servicemen executives set up shop.

Space being short, we will ignore for the moment all of the shortcomings of this report relating to commercial operations, and remind those of you who came in late that the Civil Aeronautics Act of 1938—under which the Board allegedly functions—orders this body to "permit competition to the extent necessary to assure the **sound** development of an air transportation system properly adapted to the needs of the foreign and domestic commerce of the U. S., of the postal service, and of the national defense."

This examiner's report was served Aug. 25. That was two full months after Korea's armies began marching. Yet the ivory tower atmosphere is so thick that in all the 56 typewritten pages, the national defense is mentioned not once that we could find. It is carefully ignored among the list of three specific proofs "generally required" to be shown in such cases.

Although in an almost unguarded moment the examiner on page 53 says: "**In summary, it is apparent (It isn't—Editor's note) that most of the public benefits which have been alleged by the applicants can be provided by the presently certificated carriers. An enlarged reserve pool of equipment and flight personnel can be obtained along with lower rates for shippers equally well by the presently certificated carriers as by the applicants.**"

A look at the record shows no such thing, as we will point out.

Why ignore the national defense in this case? It's high time CAB started thinking about this aspect of aviation cases again. Certainly the certificated airlines have been citing this as a major reason for mail subsidies for some years now. Here are two nonscheduled air carriers who never have had and still don't want mail subsidy, and both have distinguished records of meeting the demands of our armed services in emergencies.

First, we can safely take it that the military services want all of the commercial transport aircraft flying that this country can support economically. When they need that mysterious "enlarged reserve pool of equipment and flight personnel" the examiner refers to, they need it plenty quick.

Apparently, the military commanders disagree with the cloistered examiner that the presently certificated passenger carriers' resources are sufficient.

Seaboard & Western, to name one of the two applicants, has come to quick aid of its country on at least three important occasions. Transocean has been pressed into service by the military several times, too.

When the Russians blockaded Berlin in 1948, the Air Force needed more cargo transports immediately for trans-Atlantic support, and it cried for help. The three certificated American North Atlantic carriers, by the very nature of their scheduled operations and their combination passenger-cargo type planes, were unable to respond immediately.

The Air Force sent a plea to several irregular carriers, and Seaboard's first two planes had already taken off from Westover Field, with heavy emergency cargoes, before any other company's plane had even arrived to load up.

Of the 274 flights made for the Air Force by contract carriers on this trans-Atlantic support mission, the irregular carriers flew 221, or more than four times the flights made by the certificated companies. The official record on cargo flights showed 106 for Seaboard, 65 for Alaska, 50 for Transocean, against 41 for American Overseas, 7 for TWA and 5 for Pan American.

This is the kind of record you do not read about in the 56-page examiner's report in this case.

"Not even when the Army began its passenger 'war bride' lift program from Germany to the U. S. could the certificated carriers do the job in its entirety," Seaboard's President Raymond Norden said during the hearings on this case. "Seaboard and two other non-certificated carriers were called upon to do a part of that also. Of the 374 passenger flights for the Army, the three irregulars flew 164."

CAB last year sincerely commended Seaboard for this type of service to its country. The then chairman, Joseph O'Connell, forwarded statistical material to the Senate Committee on Interstate & Foreign Commerce indicating the line was a passenger-carrying irregular. The truth was that over 90 percent of the "passengers" shown in the Board's figures were Army and Air Force personnel carried during the emergency at the behest of the armed forces. In the same exhibit, Seaboard—an international cargo carrier—was inaccurately lumped with domestic nonskeds.

The record of the trans-Pacific Airlift in the Korea campaign is still being written. But according to MATS, a Seaboard & Western DC-4 was the first commercial plane to run this contract lift. Seaboard's aircraft utilization is believed to be unsurpassed by the other contractors.

This is the kind of carrier the CAB would put out of business. Without any criticism of the scheduled carriers, we disagree with CAB's examiner.

—Robert H. Wood

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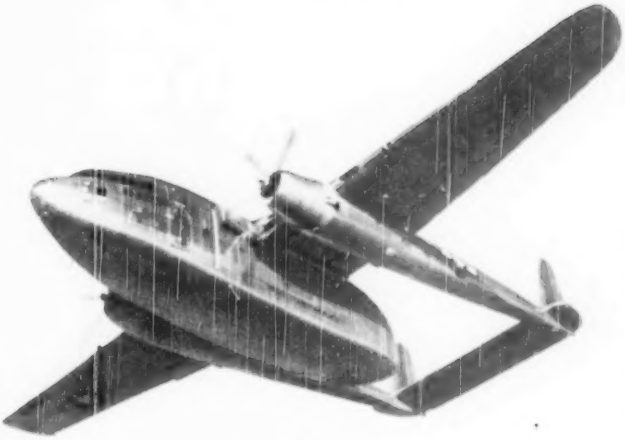

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